

SEQUENCE LISTING

<110> ROBERTS, JOSEPH
 SETHURAMAN, NATARAJAN
 MACALLISTER, THOMAS

<120> CLONING, OVEREXPRESSION AND THERAPEUTIC USE OF
 BIOACTIVE HISTIDINE AMMONIA LYASE

<130> 078728/0106

<140> 09/833,745

<141> 2001-04-13

<150> 60/197,770

<151> 2000-04-14

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<170> PatentIn Ver. 2.1

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Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	Met
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093345-071801

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Pro	Gln	Val 35	Leu	Glu	Glu	Leu	Ala 40	Ser	Val	Arg	Ala	His 45	Ile	Asp	Ala
Leu	Ala 50	Ser	Ala	Asp	Thr	Pro 55	Val	Tyr	Gly	Ile	Ser 60	Thr	Gly	Phe	Gly
Ala 65	Leu	Ala	Thr	Arg	His 70	Ile	Ala	Pro	Glu	Asp 75	Arg	Ala	Lys	Leu	Gln 80
Arg	Ser	Leu	Ile	Arg 85	Ser	His	Ala	Ala	Gly 90	Met	Gly	Glu	Pro	Val 95	Glu
Arg	Glu	Val	Val 100	Arg	Ala	Leu	Met	Phe 105	Leu	Arg	Ala	Lys	Thr 110	Leu	Ala
Ser	Gly	Arg 115	Thr	Gly	Val	Arg	Pro 120	Val	Val	Leu	Glu	Thr 125	Met	Val	Gly
Met 130	Leu	Asn	Ala	Gly	Ile	Thr 135	Pro	Val	Val	Arg	Glu 140	Tyr	Gly	Ser	Leu
Gly 145	Cys	Ser	Gly	Asp	Leu 150	Ala	Pro	Leu	Ser	His 155	Cys	Ala	Leu	Val	Leu 160
Met	Gly	Glu	Gly	Glu 165	Ala	Thr	Asp	Ala	His 170	Gly	Asp	Ile	Arg	Pro 175	Val
Pro	Glu	Leu	Phe 180	Ala	Glu	Ala	Gly	Leu 185	Thr	Pro	Val	Glu	Leu	Ala	Glu
Lys	Glu	Gly 195	Leu	Ala	Leu	Val	Asn 200	Gly	Thr	Asp	Gly	Met 205	Leu	Gly	Gln
Leu 210	Ile	Met	Ala	Leu	Ala	Asp 215	Leu	Asp	Glu	Leu	Leu 220	Asp	Ile	Ala	Asp
Ala 225	Thr	Ala	Ala	Met	Ser 230	Val	Glu	Ala	Gln	Leu 235	Gly	Thr	Asp	Gln	Val 240

Phe Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly
245 250 255

Arg Ser Ala Gln Asn Met Phe Ala Phe Leu Ala Asp Ser Pro Ile Val
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Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
35 40 45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
50 55 60

Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
65 70 75 80

Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu
85 90 95

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala
100 105 110

Ser Gly Arg Thr Gly Val Arg Pro Val Val Leu Glu Thr Met Val Gly
115 120 125

Met Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu
130 135 140

Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu
145 150 155 160

Met Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val
165 170 175

Pro Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu
180 185 190

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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser
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Pro	Gln	Val	Leu	Glu	Glu	Leu	Ala	Ser	Val	Arg	Ala	His	Ile	Asp	Ala
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Ala	Leu	Ala	Thr	Arg	His	Ile	Ala	Pro	Glu	Asp	Arg	Ala	Lys	Leu	Gln
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Arg	Glu	Val	Val	Arg	Ala	Leu	Met	Phe	Leu	Arg	Ala	Lys	Thr	Leu	Ala
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Ser	Gly	Arg	Thr	Gly	Val	Arg	Pro	Val	Val	Leu	Glu	Thr	Met	Val	Gly
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Met	Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	Arg	Glu	Tyr	Gly	Ser	Leu
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Gly	Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu
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Met	Gly	Glu	Gly	Glu	Ala	Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val
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Pro	Glu	Leu	Phe	Ala	Glu	Ala	Gly	Leu	Thr	Pro	Val	Glu	Leu	Ala	Glu
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Lys	Glu	Gly	Leu	Ala	Leu	Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln
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Leu	Ile	Met	Ala	Leu	Ala	Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp
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Phe	Arg	Ala	Glu	Leu	His	Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly
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Arg	Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val
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Ala	Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu
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Arg	Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His
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Ala	Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro
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Val	Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly
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340 345 350

Leu Gly Ser Ile Ala Glu Arg Arg Thr Asp Arg Met Leu Asp Pro Ala
355 360 365

Arg Ser Arg Asp Leu Pro Ala Phe Leu Ala Asp Asp Pro Gly Val Asp
370 375 380

Ser Gly Met Met Ile Ala Gln Tyr Thr Gln Ala Gly Leu Val Ala Glu
385 390 395 400

Asn Lys Arg Leu Ala Val Pro Ala Ser Val Asp Ser Ile Pro Ser Ser
405 410 415

Ala Met Gln Glu Asp His Val Ser Leu Gly Trp His Ala Ala Arg Lys
420 425 430

Leu Arg Thr Ser Val Ala Asn Leu Arg Arg Ile Leu Ala Val Glu Met
435 440 445

Leu Ile Ala Gly Arg Ala Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly
450 455 460

Pro Ala Thr Gly Ala Val Leu Glu Val Leu Arg Ser Lys Val Ala Gly
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<223> Description of Artificial Sequence: Synthetic
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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser
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Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
      35              40              45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
      50              55              60

Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
      65              70              75              80

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Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu
85 90 95

Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala
100 105 110

Ser Gly Arg Ser Val Arg Pro Val Val Leu Glu Thr Met Val Gly Met
115 120 125

Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu Gly
130 135 140

Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu Met
145 150 155 160

Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val Pro
165 170 175

Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu Lys
180 185 190

Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln Leu
195 200 205

Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp Ala
210 215 220

Thr Ala Ala Met Ser Val Glu Ala Gln Leu Gly Thr Asp Gln Val Phe
225 230 235 240

Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly Arg
245 250 255

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20 25 30

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
35 40 45

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Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
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 Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
 65 70 75 80
 Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu
 85 90 95
 Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala
 100 105 110
 Ser Gly Arg Ser Val Arg Pro Val Val Leu Glu Thr Met Val Gly Met
 115 120 125
 Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu Gly
 130 135 140
 Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu Met
 145 150 155 160
 Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val Pro
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 Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu Lys
 180 185 190
 Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln Leu
 195 200 205
 Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp Ala
 210 215 220
 Thr Ala Ala Met Ser Val Glu Ala Gln Leu Gly Thr Asp Gln Val Phe
 225 230 235 240
 Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly Arg
 245 250 255
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 260 265 270
 Ser His Arg Glu Gly Asp Gly Arg Val Gln Asp Ala Tyr Ser Leu Arg
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 290 295 300
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 305 310 315 320
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 325 330 335
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 355 360 365

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Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
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Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala
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Ser Gly Arg Ser Val Arg Pro Val Val Leu Glu Thr Met Val Gly Met
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Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu Met
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Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val Pro
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Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu Lys
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Glu	Gly	Leu	Ala	Leu	Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	Leu
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Ile	Met	Ala	Leu	Ala	Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	Ala
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Thr	Ala	Ala	Met	Ser	Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	Phe
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Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala
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Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg
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Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His	Ala
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Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro	Val
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Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly	Ala
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Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Asp	Leu
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Gly	Ser	Ile	Ala	Glu	Arg	Arg	Thr	Asp	Arg	Met	Leu	Asp	Pro	Ala	Arg
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Ser	Arg	Asp	Leu	Pro	Ala	Phe	Leu	Ala	Asp	Asp	Pro	Gly	Val	Asp	Ser
	370					375					380				
Gly	Met	Met	Ile	Ala	Gln	Tyr	Thr	Gln	Ala	Gly	Leu	Val	Ala	Glu	Asn
385					390					395					400
Lys	Arg	Leu	Ala	Val	Pro	Ala	Val	Asp	Ser	Ile	Pro	Ser	Ser	Ala	Met
				405					410					415	
Gln	Glu	Asp	His	Val	Ser	Leu	Gly	Trp	His	Ala	Ala	Arg	Lys	Leu	Pro
			420					425					430		
Thr	Ser	Val	Ala	Asn	Leu	Arg	Arg	Ile	Leu	Ala	Val	Glu	Met	Leu	Ile
		435					440					445			
Ala	Gly	Arg	Ala	Leu	Asp	Leu	Arg	Ala	Pro	Leu	Lys	Pro	Gly	Pro	Ala
	450					455					460				
Thr	Gly	Ala	Val	Leu	Glu	Val	Leu	Arg	Ser	Lys	Val	Ala	Gly	Pro	Gly
465					470					475					480
Gln	Asp	Arg	Phe	Leu	Ser	Ala	Glu	Leu	Glu	Ala	Ala	Tyr	Asp	Leu	Leu
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0903245-021001

Ala Asn Gly Ser Val His Lys Ala Leu Glu Ala His Leu Pro Glu
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tccgtccgag cacatatcga tgcactagca tccgctgata ccccggttta tggcatttca 180
accggctttg gcgcgttggc aaccgcgccac atcgaccccg aggatcgcg caagctgcag 240
cgctccctca tccgttccca cgctgctggc atgggtgaac cgggtggagcg cgaagtggtc 300
cgcgattga tgttcttgcg tgcaaagacc ctggcttccg gccgcagcgt tcgcccgggt 360
gtccttgaga ccatggctcg catgctcaat gcaggcatca ctccggtagt ccgcgaatac 420
ggttcactgg gctgctccgg tgacttggct ccgctgtcgc actgcgcatt agtgctgatg 480
ggcgagggcg aagccaccga tgcccacggc gacatccgcc cggtagcgga actgttcgcc 540
gagcccgat tgaccctgt cgaactggca gaaaaggaag gcctggctct ggtcaacggc 600
accgacggca tgctcggcca gctgatcatg gcattggcgg acctcgatga gctgctggac 660
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<210> 14

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24

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<210> 20

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18

<210> 22

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18

<210> 23

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<210> 26
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18

<210> 27
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<210> 30
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<210> 31
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<400> 31
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 FOR NO. 942350

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<213> Pseudomonas putida

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 20 25 30

Pro Ala Ile Asp Ala Ser Val Ala Cys Val Glu Gln Ile Ile Ala Glu
 35 40 45

Asp Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly Leu Leu Ala Ser
 50 55 60

Thr Arg Ile Ala Ser His Asp Leu Glu Asn Leu Gln Arg Ser Leu Val
 65 70 75 80

Leu Ser His Ala Ala Gly Ile Gly Ala Pro Leu Asp Asp Asp Leu Val
 85 90 95

Arg Leu Ile Met Val Leu Lys Ile Asn Ser Leu Ser Arg Gly Phe Ser
 100 105 110

Gly Ile Arg Arg Lys Val Ile Asp Ala Leu Ile Ala Leu Val Asn Ala
 115 120 125

Glu Val Tyr Pro His Ile Pro Leu Lys Gly Ser Val Gly Ala Ser Gly
 130 135 140

Asp Leu Ala Pro Leu Ala Thr Met Ser Leu Val Leu Leu Gly Glu Gly
 145 150 155 160

Lys Ala Arg Tyr Lys Gly Gln Trp Leu Ser Ala Thr Glu Ala Leu Ala
 165 170 175

09334-071601

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Phe	Tyr	Ala	Glu	Asp	Leu	Tyr	Ala	Ala	Ala	Ile	Ala	Cys	Gly	Gly	Leu
	210					215					220				
Ser	Val	Glu	Ala	Val	Leu	Gly	Ser	Arg	Ser	Pro	Phe	Asp	Ala	Arg	Ile
225					230					235					240
His	Glu	Ala	Arg	Gly	Gln	Arg	Gly	Gln	Ile	Asp	Thr	Ala	Ala	Cys	Phe
				245					250					255	
Arg	Asp	Leu	Leu	Gly	Asp	Ser	Ser	Glu	Val	Ser	Leu	Ser	His	Lys	Asn
			260					265					270		
Cys	Asp	Lys	Val	Gln	Asp	Pro	Tyr	Ser	Leu	Arg	Cys	Gln	Pro	Gln	Val
		275					280					285			
Met	Gly	Ala	Cys	Leu	Thr	Gln	Leu	Arg	Gln	Ala	Ala	Glu	Val	Leu	Gly
	290					295					300				
Ile	Glu	Ala	Asn	Ala	Val	Ser	Asp	Asn	Pro	Leu	Val	Phe	Ala	Ala	Glu
305					310					315					320
Gly	Asp	Val	Ile	Ser	Gly	Gly	Asn	Phe	His	Ala	Glu	Pro	Val	Ala	Met
				325					330					335	
Ala	Ala	Asp	Asn	Leu	Ala	Leu	Ala	Ile	Ala	Glu	Ile	Gly	Ser	Leu	Ser
			340					345					350		
Glu	Arg	Arg	Ile	Ser	Leu	Met	Met	Asp	Lys	His	Met	Ser	Gln	Leu	Pro
		355					360					365			
Pro	Phe	Leu	Val	Glu	Asn	Gly	Gly	Val	Asn	Ser	Gly	Phe	Met	Ile	Ala
	370					375					380				
Gln	Val	Thr	Ala	Ala	Ala	Leu	Ala	Ser	Glu	Asn	Lys	Ala	Leu	Ser	His
385					390					395					400
Pro	His	Ser	Val	Asp	Ser	Leu	Pro	Thr	Ser	Ala	Asn	Gln	Glu	Asp	His
				405					410					415	
Val	Ser	Met	Ala	Pro	Ala	Ala	Gly	Lys	Arg	Leu	Trp	Glu	Met	Ala	Glu
			420					425					430		
Asn	Thr	Arg	Gly	Val	Pro	Ala	Ile	Glu	Trp	Leu	Gly	Ala	Cys	Gln	Gly
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Leu	Asp	Leu	Arg	Lys	Gly	Leu	Lys	Thr	Ser	Ala	Lys	Leu	Glu	Lys	Ala
	450					455					460				
Arg	Gln	Ala	Leu	Arg	Ser	Glu	Val	Ala	His	Tyr	Asp	Arg	Asp	Arg	Phe
465					470					475					480

Ser Thr Asp Ala Ala Met Gly Ser Ser Ala Pro Phe His Pro Asp Ile
225 230 235 240

Gln His Cys Ala Ala Ile Arg Ala Arg Ser Thr Arg Ala Ala Ala Leu
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 Arg Gln Leu Leu Thr Gly Ser Pro Ile Arg Gln Ser His Ile Glu Gly
 260 265 270
 Asp Glu Arg Val Gln Asp Pro Tyr Cys Ile Arg Cys Gln Pro Gln Val
 275 280 285
 Asp Gly Ala Cys Leu Asp Leu Leu Arg Ser Val Ala Ala Thr Leu Thr
 290 295 300
 Ile Glu Ala Asn Ala Val Thr Asp Asn Pro Leu Val Leu Ser Asp Asn
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 Ser Val Val Ser Gly Gly Asn Phe His Ala Glu Pro Val Ala Phe Ala
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 370 375 380
 Glu Val Thr Ser Ala Ala Leu Met Ser Glu Asn Lys Gln Leu Ser His
 385 390 395 400
 Pro Ala Ser Val Asp Ser Thr Pro Thr Ser Ala Asn Gln Glu Asp His
 405 410 415
 Val Ser Met Ala Cys His Gly Ala Arg Arg Leu Leu Gln Met Thr Glu
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 Asn Leu Phe Ser Ile Ile Gly Ile Glu Ala Leu Ala Ala Val Gln Gly
 435 440 445
 Ile Glu Phe Arg Ala Pro Leu Thr Thr Ser Pro Glu Leu Gln Lys Ala
 450 455 460
 Ala Ala Ala Val Arg Gly Val Ser Ser Ser Ile Glu Glu Asp Arg Tyr
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103720 "SHZEEB60

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Asp	Glu 50	Val	Gln	Phe	Leu	Val 55	His	Arg	Cys	Lys	Gly 60	Leu	Gly	Leu	Leu
Asp 65	Asn	Glu	Asp	Glu	Leu 70	Glu	Val	Ala	Leu	Glu 75	Asp	Asn	Glu	Phe	Val 80
Glu	Val	Val	Ile	Glu 85	Gly	Asp	Val	Met	Ser 90	Pro	Asp	Phe	Ile	Pro 95	Ser
Gln	Pro	Glu	Gly 100	Val	Phe	Leu	Tyr 105	Ser	Lys	Tyr	Arg	Glu 110	Pro	Glu	Lys
Tyr	Ile	Ala 115	Leu	Asp	Gly	Asp	Ser 120	Leu	Ser	Thr	Glu	Asp 125	Leu	Val	Asn
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Lys 145	Val	Gln	Gln	Ser	Arg 150	Glu	Val	Ile	Asp	Ser 155	Ile	Ile	Lys	Glu	Arg 160
Thr	Val	Val	Tyr	Gly 165	Ile	Thr	Thr	Gly	Phe 170	Gly	Lys	Phe	Ala	Arg 175	Thr
Val	Ile	Pro	Ala 180	Asn	Lys	Leu	Gln	Glu 185	Leu	Gln	Val	Asn	Leu 190	Val	Arg
Ser	His	Ser 195	Ser	Gly	Val	Gly	Lys 200	Pro	Leu	Ser	Pro	Glu 205	Arg	Cys	Arg
Met 210	Leu	Leu	Ala	Leu	Arg	Ile 215	Asn	Val	Leu	Ala	Lys 220	Gly	Tyr	Ser	Gly
Ile 225	Ser	Leu	Glu	Thr	Leu 230	Lys	Gln	Val	Ile	Glu 235	Ala	Phe	Asn	Ala	Ser 240
Cys	Leu	Ser	Tyr	Val 245	Pro	Glu	Lys	Gly	Thr 250	Val	Gly	Ala	Ser	Gly 255	Asp
Leu	Ala	Pro	Leu 260	Ser	His	Leu	Ala 265	Leu	Gly	Leu	Ile	Gly	Glu 270	Gly	Lys
Met	Trp 275	Ser	Pro	Lys	Ser	Gly	Trp 280	Ala	Asp	Ala	Lys	Tyr 285	Val	Leu	Glu
Ala	His 290	Gly	Leu	Lys	Pro	Ile 295	Val	Leu	Lys	Pro	Lys 300	Glu	Gly	Leu	Ala

Leu 305	Ile	Asn	Gly	Thr	Gln 310	Met	Ile	Thr	Ser	Leu 315	Gly	Cys	Glu	Ala	Leu 320
Glu	Arg	Ala	Ser	Ala 325	Ile	Ala	Arg	Gln	Ala 330	Asp	Ile	Val	Ala	Ala 335	Leu
Thr	Leu	Glu	Val 340	Leu	Lys	Gly	Thr	Thr 345	Lys	Ala	Phe	Asp	Thr 350	Asp	Ile
His	Ala	Val 355	Arg	Pro	His	Arg	Gly 360	Gln	Ile	Glu	Val	Ala 365	Phe	Arg	Phe
Arg	Ser 370	Leu	Leu	Asp	Ser	Asp 375	His	His	Pro	Ser	Glu 380	Ile	Ala	Glu	Ser
His 385	Arg	Phe	Cys	Asp	Arg 390	Val	Gln	Asp	Ala	Tyr 395	Thr	Leu	Arg	Cys	Cys 400
Pro	Gln	Val	His	Gly 405	Val	Val	Asn	Asp	Thr 410	Ile	Ala	Phe	Val	Lys	Asp 415
Ile	Ile	Thr	Thr 420	Glu	Leu	Asn	Ser	Ala 425	Thr	Asp	Asn	Pro	Met 430	Val	Phe
Ala	Ser	Arg 435	Gly	Glu	Thr	Ile	Ser 440	Gly	Gly	Asn	Phe	His 445	Gly	Glu	Tyr
Pro	Ala 450	Lys	Ala	Leu	Asp	Tyr 455	Leu	Ala	Ile	Gly	Val 460	His	Glu	Leu	Ala
Ala 465	Ile	Ser	Glu	Arg	Arg 470	Ile	Glu	Arg	Leu	Cys 475	Asn	Pro	Ser	Leu	Ser 480
Glu	Leu	Pro	Ala	Phe 485	Leu	Val	Ala	Glu	Gly 490	Gly	Leu	Asn	Ser	Gly 495	Phe
Met	Ile	Ala	His 500	Cys	Thr	Ala	Ala 505	Ala	Leu	Val	Ser	Glu	Ser 510	Lys	Ala
Leu	Cys	His 515	Pro	Ser	Ser	Val	Asp 520	Ser	Leu	Ser	Thr	Ser 525	Ala	Ala	Thr
Glu 530	Asp	His	Val	Ser	Met	Gly 535	Gly	Trp	Ala	Ala	Arg 540	Lys	Ala	Leu	Arg
Val 545	Val	Glu	His	Val	Glu 550	Gln	Val	Leu	Ala	Ile 555	Glu	Leu	Leu	Ala	Ala 560
Cys	Gln	Gly	Ile	Glu	Phe	Leu	Arg	Pro	Leu 570	Lys	Thr	Thr	Thr	Pro 575	Leu
Glu	Lys	Val	Tyr 580	Asp	Leu	Val	Arg	Ser 585	Val	Val	Arg	Pro	Trp 590	Ile	Lys
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FOR 20" 542E850

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	50					55					60				
Asp	Asn	Glu	Asp	Leu	Leu	Glu	Val	Ala	Leu	Glu	Asp	Asn	Glu	Phe	Val
65					70					75					80
Glu	Val	Val	Ile	Glu	Gly	Asp	Val	Met	Ser	Pro	Asp	Phe	Ile	Pro	Ser
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Gln	Pro	Glu	Gly	Val	Phe	Leu	Tyr	Ser	Lys	Tyr	Arg	Glu	Pro	Glu	Lys
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Tyr	Ile	Ala	Leu	Asp	Gly	Asp	Ser	Leu	Ser	Thr	Glu	Asp	Leu	Val	Asn
		115					120					125			
Leu	Gly	Lys	Gly	His	Tyr	Lys	Ile	Lys	Leu	Thr	Ser	Ile	Ala	Glu	Lys
	130					135					140				
Lys	Val	Gln	Gln	Ser	Arg	Glu	Val	Ile	Asp	Ser	Ile	Ile	Lys	Glu	Arg
145					150					155					160
Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly	Lys	Phe	Ala	Arg	Thr
				165					170					175	
Val	Ile	Pro	Ala	Asn	Lys	Leu	Gln	Glu	Leu	Gln	Val	Asn	Leu	Val	Arg
			180					185					190		
Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser	Pro	Glu	Arg	Cys	Arg
		195					200					205			

Met 210	Leu	Leu	Ala	Leu	Arg	Ile 215	Asn	Val	Leu	Ala	Lys 220	Gly	Tyr	Ser	Gly
Ile 225	Ser	Leu	Glu	Thr	Leu 230	Lys	Gln	Val	Ile	Glu 235	Val	Phe	Asn	Ala	Ser 240
Cys	Leu	Ser	Tyr	Val 245	Pro	Glu	Lys	Gly	Thr 250	Val	Gly	Ala	Ser	Gly 255	Asp
Leu	Ala	Pro	Leu 260	Ser	His	Leu	Ala	Leu 265	Gly	Leu	Ile	Gly	Glu 270	Gly	Lys
Met	Trp	Ser 275	Pro	Lys	Ser	Gly	Trp 280	Ala	Asp	Ala	Lys	Tyr 285	Val	Leu	Glu
Ala	His 290	Gly	Leu	Lys	Pro	Ile 295	Val	Leu	Lys	Pro	Lys 300	Glu	Gly	Leu	Ala
Leu 305	Ile	Asn	Gly	Thr	Gln 310	Met	Ile	Thr	Ser	Leu 315	Gly	Cys	Glu	Ala	Val 320
Glu	Arg	Ala	Ser	Ala 325	Ile	Ala	Arg	Gln	Ala 330	Asp	Ile	Val	Ala	Ala 335	Leu
Thr	Leu	Glu	Val 340	Leu	Lys	Gly	Thr 345	Thr	Lys	Ala	Phe	Asp	Thr 350	Asp	Ile
His	Ala	Val 355	Arg	Pro	His	Arg	Gly 360	Gln	Ile	Glu	Val	Ala 365	Phe	Arg	Phe
Arg	Ser 370	Leu	Leu	Asp	Ser	Asp 375	His	His	Pro	Ser	Glu 380	Ile	Ala	Glu	Ser
His 385	Arg	Phe	Cys	Asp	Arg 390	Val	Gln	Asp	Ala	Tyr 395	Thr	Leu	Arg	Cys	Cys 400
Pro	Gln	Val	His	Gly 405	Val	Val	Asn	Asp	Thr 410	Ile	Ala	Phe	Val	Lys 415	Asp
Ile	Ile	Thr	Thr 420	Glu	Leu	Asn	Ser	Ala 425	Thr	Asp	Asn	Pro	Met 430	Val	Phe
Ala	Ser 435	Arg	Gly	Glu	Thr	Ile	Ser 440	Gly	Gly	Asn	Phe	His 445	Gly	Glu	Tyr
Pro 450	Ala	Lys	Ala	Leu	Asp	Tyr 455	Leu	Ala	Ile	Gly	Val 460	His	Glu	Leu	Ala
Ala 465	Ile	Ser	Glu	Arg	Arg 470	Ile	Glu	Arg	Leu	Cys 475	Asn	Pro	Ser	Leu	Ser 480
Glu	Leu	Pro	Ala	Phe 485	Leu	Val	Ala	Glu	Gly 490	Gly	Leu	Asn	Ser	Gly 495	Phe
Met	Ile	Ala	His 500	Cys	Thr	Ala	Ala	Ala 505	Leu	Val	Ser	Glu	Ser 510	Lys	Ala

Leu

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Leu	Gly	Lys	Gly	Arg	Tyr	Lys	Ile	Lys	Leu	Thr	Pro	Thr	Ala	Glu	Lys	
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Arg	Val	Gln	Lys	Ser	Arg	Glu	Val	Ile	Asp	Ser	Ile	Ile	Lys	Glu	Lys	
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Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly	Lys	Phe	Ala	Arg	Thr	
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Val	Ile	Pro	Ile	Asn	Lys	Leu	Gln	Glu	Leu	Gln	Val	Asn	Leu	Val	Arg	
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Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser	Pro	Glu	Arg	Cys	Arg	
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Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Val	Leu	Ala	Lys	Gly	Tyr	Ser	Gly	
	210					215					220					
Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu	Met	Phe	Asn	Ala	Ser	
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Cys	Leu	Pro	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val	Gly	Ala	Ser	Gly	Asp	
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Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu	Val	Gly	Glu	Gly	Lys	
			260					265					270			
Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala	Lys	Tyr	Val	Leu	Glu	
		275				280						285				
Ala	His	Gly	Leu	Lys	Pro	Val	Ile	Leu	Lys	Pro	Lys	Glu	Gly	Leu	Ala	
	290					295					300					
Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu	Gly	Cys	Glu	Ala	Val	
305					310					315					320	
Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp	Ile	Val	Ala	Ala	Leu	
				325					330					335		
Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala	Phe	Asp	Thr	Asp	Ile	
			340					345					350			
His	Ala	Leu	Arg	Pro	His	Arg	Gly	Gln	Ile	Glu	Val	Ala	Phe	Arg	Phe	
		355					360					365				
Arg	Ser	Leu	Leu	Asp	Ser	Leu	Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	
	370					375					380					
Val	Asn	Asp	Thr	Ile	Ala	Phe	Val	Lys	Asn	Ile	Ile	Thr	Thr	Glu	Leu	
385					390					395					400	
Asn	Ser	Ala	Thr	Asp	Asn	Pro	Met	Val	Phe	Ala	Asn	Arg	Gly	Glu	Thr	
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<211> 677
<212> PRT
<213> Caenorhabditis elegans
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Lys Pro Asp Asp Thr Ile His Ala Val Ala Lys Lys Ser Val Glu Lys
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Leu Arg Arg Leu Arg Pro Lys Leu Pro Leu Ala Asp Asp Tyr Phe Glu
      35              40              45

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Val	Arg	Arg	Thr	Val	Gly	Asn	Ser	Leu	Leu	Asp	Pro	Glu	Asp	Leu	Val
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Glu	Glu	Thr	Glu	Asp	Ala	Lys	Glu	Ala	Lys	Lys	Gln	Glu	Glu	Ile	Asp
				85					90					95	
Asn	Ala	Arg	Ala	Glu	Ile	Glu	Lys	Ile	Asp	Asn	Arg	Arg	Arg	Lys	Val
			100					105					110		
Ser	Phe	Ala	Asp	Ser	Leu	Ala	Pro	Met	Val	Leu	Ala	Pro	Pro	Thr	Lys
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Leu	Leu	Ile	Leu	Asp	Gly	Asn	Ser	Leu	Leu	Pro	Glu	Asp	Leu	Val	Arg
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Cys	Glu	Lys	Gly	Glu	Cys	Ala	Ile	Gln	Leu	Ser	Met	Glu	Ser	Glu	Asp
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Arg	Ile	Arg	Lys	Ala	Arg	Thr	Phe	Leu	Glu	Lys	Ile	Ala	Ser	Glu	His
				165					170					175	
Arg	Ala	Val	Tyr	Gly	Val	Thr	Thr	Gly	Phe	Gly	Thr	Phe	Ser	Asn	Val
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Thr	Ile	Pro	Pro	Glu	Lys	Leu	Lys	Lys	Leu	Gln	Leu	Asn	Leu	Ile	Arg
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Ser	His	Ala	Thr	Gly	Tyr	Gly	Glu	Pro	Leu	Ala	Pro	Asn	Arg	Ala	Arg
	210					215					220				
Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Ile	Leu	Ala	Lys	Gly	His	Ser	Gly
225					230					235					240
Ile	Ser	Val	Glu	Asn	Ile	Lys	Lys	Met	Ile	Ala	Ala	Phe	Asn	Ala	Phe
				245					250					255	
Cys	Val	Ser	Tyr	Val	Pro	Gln	Gln	Gly	Thr	Val	Gly	Cys	Ser	Gly	Asp
			260					265					270		
Leu	Cys	Pro	Leu	Ala	His	Leu	Ala	Leu	Gly	Leu	Leu	Gly	Glu	Gly	Lys
		275					280					285			
Met	Trp	Ser	Pro	Thr	Thr	Gly	Trp	Gln	Pro	Ala	Asp	Val	Val	Leu	Lys
	290					295					300				
Lys	Asn	Asn	Leu	Glu	Pro	Leu	Glu	Leu	Gly	Pro	Lys	Glu	Gly	Leu	Ala
305					310					315					320
Leu	Ile	Asn	Gly	Thr	Gln	Met	Val	Thr	Ala	Leu	Gly	Ala	Tyr	Thr	Leu
				325					330					335	
Glu	Arg	Ala	His	Asn	Ile	Ala	Arg	Gln	Ala	Asp	Val	Ile	Ala	Ala	Leu
			340					345					350		

Ser	Leu	Asp	Val	Leu	Lys	Gly	Thr	Thr	Arg	Ala	Tyr	Asp	Pro	Asp	Ile
		355					360					365			
His	Arg	Ile	Arg	Pro	His	Arg	Gly	Gln	Asn	Leu	Ser	Ala	Leu	Arg	Leu
	370					375					380				
Arg	Ala	Leu	Leu	His	Ser	Glu	Ala	Asn	Pro	Ser	Gln	Ile	Ala	Glu	Ser
385					390					395					400
His	Arg	Asn	Cys	Thr	Lys	Val	Gln	Asp	Ala	Tyr	Thr	Leu	Arg	Cys	Val
				405					410					415	
Pro	Gln	Val	His	Gly	Val	Val	His	Asp	Thr	Ile	Glu	Phe	Val	Arg	Glu
			420					425					430		
Ile	Ile	Thr	Thr	Glu	Met	Asn	Ser	Ala	Thr	Asp	Asn	Pro	Leu	Val	Phe
		435					440					445			
Ala	Asp	Arg	Glu	Glu	Ile	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly	Glu	Tyr
	450					455					460				
Pro	Ala	Lys	Ala	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Glu	Leu	Ala
465					470					475					480
Gln	Met	Ser	Glu	Arg	Arg	Leu	Glu	Arg	Leu	Val	Asn	Lys	Glu	Leu	Ser
				485					490					495	
Gly	Leu	Pro	Thr	Glu	Leu	Thr	Pro	Asp	Gly	Gly	Leu	Asn	Ser	Gly	Phe
			500					505					510		
Met	Thr	Val	Gln	Leu	Cys	Ala	Ala	Ser	Leu	Val	Ser	Glu	Asn	Lys	Val
		515					520					525			
Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Ile	Pro	Thr	Ser	Cys	Asn	Gln
	530					535					540				
Glu	Asp	His	Val	Ser	Met	Gly	Gly	Phe	Ala	Ala	Arg	Lys	Ala	Leu	Thr
545					550					555					560
Val	Val	Glu	His	Val	Glu	Ala	Val	Leu	Ala	Met	Glu	Leu	Leu	Ala	Ala
				565					570					575	
Cys	Gln	Gly	Ile	Glu	Phe	Leu	Lys	Pro	Leu	Ile	Ser	Thr	Ala	Pro	Leu
			580					585					590		
His	Lys	Ile	Tyr	Gln	Leu	Val	Arg	Ser	Val	Ala	Pro	Pro	Leu	Asn	Glu
		595					600					605			
Asp	Arg	Tyr	Met	Lys	Pro	Glu	Ile	Asp	Ala	Val	Leu	Glu	Met	Ile	Arg
	610					615					620				
Glu	Asn	Arg	Ile	Trp	Glu	Ala	Val	Leu	Pro	His	Leu	Glu	Thr	Leu	Glu
625					630					635					640
Ala	Met	Glu	Glu	Leu	Asp	Pro	Asp	Ala	Leu	Arg	Gln	Phe	Thr	Lys	Thr
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Val	Leu	Phe	Asp 20	Phe	Glu	Glu	Ala	Ala 25	Ala	Ser	Glu	Glu	Ser 30	Met	Glu
Arg	Val	Lys 35	Lys	Ser	Arg	Ala	Ala 40	Val	Glu	Arg	Ile	Val 45	Arg	Asp	Glu
Lys	Thr 50	Ile	Tyr	Gly	Ile	Asn 55	Thr	Gly	Phe	Gly	Lys 60	Phe	Ser	Asp	Val
Leu 65	Ile	Gln	Lys	Glu	Asp 70	Ser	Ala	Ala	Leu	Gln 75	Leu	Asn	Leu	Ile	Leu 80
Ser	His	Ala	Cys	Gly 85	Val	Gly	Asp	Pro	Phe 90	Pro	Glu	Cys	Val	Ser 95	Arg
Ala	Met	Leu	Leu 100	Leu	Arg	Ala	Asn 105	Ala	Leu	Leu	Lys	Gly	Phe 110	Ser	Gly
Val	Arg	Ala 115	Glu	Leu	Ile	Glu	Gln 120	Leu	Leu	Ala	Phe	Leu 125	Asn	Lys	Arg
Val 130	His	Pro	Val	Ile	Pro	Gln 135	Gln	Gly	Ser	Leu	Gly 140	Ala	Ser	Gly	Asp
Leu 145	Ala	Pro	Leu	Ser	His 150	Leu	Ala	Leu	Ala	Leu 155	Ile	Gly	Gln	Gly	Glu 160
Val	Phe	Phe	Glu	Gly 165	Glu	Arg	Met	Pro	Ala 170	Met	Thr	Gly	Leu	Lys 175	Lys
Ala	Gly	Ile	Gln 180	Pro	Val	Thr	Leu	Thr 185	Ser	Lys	Glu	Gly	Leu 190	Ala	Leu
Ile	Asn	Gly 195	Thr	Gln	Ala	Met	Thr 200	Ala	Met	Gly	Val	Val 205	Ala	Tyr	Ile
Glu	Ala 210	Glu	Lys	Leu	Ala	Tyr 215	Gln	Thr	Glu	Arg	Ile 220	Ala	Ser	Leu	Thr
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<212> PRT
<213> Streptomyces griseus
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Ala	Ala	Val	Glu	Ala	Leu	Ala	Ala	Ala	Arg	Leu	Ile	Val	Asp	Ala	Leu			35		40			45	
Ala	Ala	Lys	Pro	Glu	Pro	Val	Tyr	Gly	Val	Ser	Thr	Gly	Phe	Gly	Ala			50		55			60	
Leu	Ala	Ser	Arg	His	Ile	Gly	Thr	Glu	Leu	Arg	Ala	Gln	Leu	Gln	Arg	65		70		75			80	
Asn	Ile	Val	Arg	Ser	His	Ala	Ala	Gly	Met	Gly	Pro	Arg	Val	Glu	Arg			85		90			95	
Glu	Val	Val	Arg	Ala	Leu	Met	Phe	Leu	Arg	Leu	Lys	Thr	Val	Ala	Ser			100		105			110	
Gly	His	Thr	Gly	Val	Arg	Pro	Glu	Val	Ala	Gln	Thr	Met	Ala	Asp	Val			115		120			125	
Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	His	Glu	Tyr	Gly	Ser	Leu	Gly	130		135		140				
Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Thr	Leu	Met	145		150		155			160	
Gly	Glu	Gly	Glu	Ala	Glu	Gly	Pro	Asp	Gly	Thr	Val	Arg	Pro	Ala	Gly			165		170			175	
Glu	Leu	Leu	Ala	Ala	His	Gly	Ile	Ala	Pro	Val	Glu	Leu	Arg	Glu	Lys			180		185			190	
Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Met	Leu			195		200			205	
Val	Met	Ala	Leu	Ala	Asp	Leu	Arg	Asn	Leu	Tyr	Thr	Ser	Ala	Asp	Ile	210		215		220				
Thr	Ala	Ala	Leu	Ser	Leu	Glu	Ala	Leu	Leu	Gly	Thr	Asp	Lys	Val	Leu	225		230		235			240	
Ala	Pro	Glu	Leu	His	Ala	Ile	Arg	Pro	His	Pro	Gly	Gln	Gly	Val	Ser			245		250			255	
Ala	Asp	Asn	Met	Ser	Arg	Val	Leu	Ala	Gly	Ser	Gly	Leu	Thr	Gly	His			260		265			270	
His	Gln	Asp	Asp	Ala	Pro	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Val	Arg	Cys			275		280			285	
Ala	Pro	Gln	Val	Asn	Gly	Ala	Gly	Arg	Asp	Thr	Leu	Asp	His	Ala	Ala	290		295		300				

0983745 071801

Leu Val Ala Gly Arg Glu Leu Ala Ser Ser Val Asp Asn Pro Val Val
305 310 315 320

Leu Pro Asp Gly Arg Val Glu Ser Asn Gly Asn Phe His Gly Ala Pro
325 330 335

Val Ala Tyr Val Leu Asp Phe Leu Ala Ile Val Ala Ala Asp Leu Gly
340 345 350

Ser Ile Cys Glu Arg Arg Thr Asp Arg Leu Leu Asp Lys Asn Arg Ser
355 360 365

His Gly Leu Pro Pro Phe Leu Ala Asp Asp Ala Gly Val Asp Ser Gly
370 375 380

Leu Met Ile Ala Gln Tyr Thr Gln Ala Ala Leu Val Ser Glu Met Lys
385 390 395 400

Arg Leu Ala Val Pro Ala Ser Ala Asp Ser Ile Pro Ser Ser Ala Met
405 410 415

Gln Glu Asp His Val Ser Met Gly Trp Ser Ala Ala Arg Lys Leu Arg
420 425 430

Thr Ala Val Asp Asn Leu Ala Arg Ile Val Ala Val Glu Leu Tyr Ala
435 440 445

Ala Thr Arg Ala Ile Glu Leu Arg Ala Ala Glu Gly Leu Thr Pro Ala
450 455 460

Pro Ala Ser Glu Ala Val Val Ala Ala Leu Arg Ala Ala Gly Ala Glu
465 470 475 480

Gly Pro Gly Pro Asp Arg Phe Leu Ala Pro Asp Leu Ala Ala Ala Asp
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Thr Phe Val Arg Glu Gly Arg Leu Val Ala Ala Val Glu Pro Val Thr
500 505 510

Gly Pro Leu Ala
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<211> 511

<212> PRT

<213> Corynebacteriaceae sp.

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Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
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093346-071901

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
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 Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
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 Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Ala Lys Thr Leu Ala
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 115 120 125
 Leu Asn Ala Gly Ile Thr Pro Val Val Arg Glu Tyr Gly Ser Leu Gly
 130 135 140
 Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Val Leu Met
 145 150 155 160
 Gly Glu Gly Glu Ala Thr Asp Ala His Gly Asp Ile Arg Pro Val Pro
 165 170 175
 Glu Leu Phe Ala Glu Ala Gly Leu Thr Pro Val Glu Leu Ala Glu Lys
 180 185 190
 Glu Gly Leu Ala Leu Val Asn Gly Thr Asp Gly Met Leu Gly Gln Leu
 195 200 205
 Ile Met Ala Leu Ala Asp Leu Asp Glu Leu Leu Asp Ile Ala Asp Ala
 210 215 220
 Thr Ala Ala Met Ser Val Glu Ala Gln Leu Gly Thr Asp Gln Val Phe
 225 230 235 240
 Arg Ala Glu Leu His Glu Pro Leu Arg Pro His Pro Gly Gln Gly Arg
 245 250 255
 Ser Ala Gln Asn Met Phe Ala Phe Leu Ala Asp Ser Pro Ile Val Ala
 260 265 270
 Ser His Arg Glu Gly Asp Gly Arg Val Gln Asp Ala Tyr Ser Leu Arg
 275 280 285
 Cys Ser Pro Gln Val Thr Gly Ala Ala Arg Asp Thr Ile Ala His Ala
 290 295 300
 Arg Leu Val Ala Thr Arg Glu Leu Ala Ala Ala Ile Asp Asn Pro Val
 305 310 315 320
 Val Leu Pro Ser Gly Glu Val Thr Ser Asn Gly Asn Phe His Gly Ala
 325 330 335
 Pro Val Ala Tyr Val Leu Asp Phe Leu Ala Ile Ala Val Ala Asp Leu
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 103120-542EEB0

Gly Ser Ile Ala Glu Arg Arg Thr Asp Arg Met Leu Asp Pro Ala Arg
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 Ser Arg Asp Leu Pro Ala Phe Leu Ala Asp Asp Pro Gly Val Asp Ser
 370 375 380
 Gly Met Met Ile Ala Gln Tyr Thr Gln Ala Gly Leu Val Ala Glu Asn
 385 390 395 400
 Lys Arg Leu Ala Val Pro Ala Val Asp Ser Ile Pro Ser Ser Ala Met
 405 410 415
 Gln Glu Asp His Val Ser Leu Gly Trp His Ala Ala Arg Lys Leu Pro
 420 425 430
 Thr Ser Val Ala Asn Leu Arg Arg Ile Leu Ala Val Glu Met Leu Ile
 435 440 445
 Ala Gly Arg Ala Leu Asp Leu Arg Ala Pro Leu Lys Pro Gly Pro Ala
 450 455 460
 Thr Gly Ala Val Leu Glu Val Leu Arg Ser Lys Val Ala Gly Pro Gly
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 35 40 45
 Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
 50 55 60
 Ala Leu Ala Thr Arg His Ile Ala Pro Glu Asp Arg Ala Lys Leu Gln
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 Arg Ser Leu Ile Arg Ser His Ala Ala Gly Met Gly Glu Pro Val Glu
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Ser	Gly	Arg	Thr	Gly	Val	Arg	Pro	Val	Val	Leu	Glu	Thr	Met	Val	Gly	
		115					120					125				
Met	Leu	Asn	Ala	Gly	Ile	Thr	Pro	Val	Val	Arg	Glu	Tyr	Gly	Ser	Leu	
	130					135					140					
Gly	Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	
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Met	Gly	Glu	Gly	Glu	Ala	Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val	
				165					170					175		
Pro	Glu	Leu	Phe	Ala	Glu	Ala	Gly	Leu	Thr	Pro	Val	Glu	Leu	Ala	Glu	
			180					185					190			
Lys	Glu	Gly	Leu	Ala	Leu	Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	
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Leu	Ile	Met	Ala	Leu	Ala	Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	
	210					215					220					
Ala	Thr	Ala	Ala	Met	Ser	Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	
225					230					235					240	
Phe	Arg	Ala	Glu	Leu	His	Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	
				245					250					255		
Arg	Ser	Ala	Gln	Asn	Met	Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	
			260					265					270			
Ala	Ser	His	Arg	Glu	Gly	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	
		275					280					285				
Arg	Cys	Ser	Pro	Gln	Val	Thr	Gly	Ala	Ala	Arg	Asp	Thr	Ile	Ala	His	
	290					295					300					
Ala	Arg	Leu	Val	Ala	Thr	Arg	Glu	Leu	Ala	Ala	Ala	Ile	Asp	Asn	Pro	
305					310					315					320	
Val	Val	Leu	Pro	Ser	Gly	Glu	Val	Thr	Ser	Asn	Gly	Asn	Phe	His	Gly	
				325					330					335		
Ala	Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Asp	
			340					345					350			
Leu	Gly	Ser	Ile	Ala	Glu	Arg	Arg	Thr	Asp	Arg	Met	Leu	Asp	Pro	Ala	
		355					360					365				
Arg	Ser	Arg	Asp	Leu	Pro	Ala	Phe	Leu	Ala	Asp	Asp	Pro	Gly	Val	Asp	
	370					375					380					
Ser	Gly	Met	Met	Ile	Ala	Gln	Tyr	Thr	Gln	Ala	Gly	Leu	Val	Ala	Glu	
385					390					395					400	

093345
"0740"
F09T20 542E3B50

Ala

<400> 44

Met 1	Ala	Ser	Met	His 5	Thr	Val	Val	Val	Gly 10	Thr	Ser	Gly	Val	Thr 15	Ala
Ser	Asp	Val	Leu 20	Ala	Val	Ala	Arg	Ala 25	Gly	Ala	Arg	Ile	Glu 30	Leu	Ser
Glu	Glu	Ala 35	Val	Ala	Ala	Leu	Ala 40	Ala	Ala	Arg	Ser	Val 45	Val	Asp	Ala
Leu	Ala 50	Ala	Lys	Pro	Asp	Pro 55	Val	Tyr	Gly	Val	Ser 60	Thr	Gly	Phe	Gly
Ala 65	Leu	Ala	Thr	Arg	His 70	Ile	Ser	Pro	Glu	Leu 75	Arg	Gly	Arg	Leu	Gln 80
Arg	Asn	Ile	Val	Arg 85	Ser	His	Ala	Ala	Gly 90	Met	Gly	Pro	Arg	Val 95	Glu
Arg	Glu	Val	Val 100	Arg	Ala	Leu	Met	Phe 105	Leu	Arg	Leu	Lys	Thr 110	Val	Cys
Ser	Gly	Arg 115	Thr	Gly	Val	Arg	Pro 120	Glu	Val	Ala	Gln	Thr 125	Met	Ala	Asp
Val	Leu 130	Asn	Ala	Gly	Ile	Thr 135	Pro	Val	Val	His	Glu 140	Tyr	Gly	Ser	Leu

Gly	Cys	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Thr	Leu	145	150	155	160
Met	Gly	Glu	Gly	Asp	Ala	Glu	Gly	Pro	Asp	Gly	Thr	Val	Arg	Pro	Ala	165	170	175	
Gly	Glu	Leu	Leu	Ala	Ala	His	Gly	Ile	Ala	Pro	Val	Glu	Leu	Arg	Glu	180	185	190	
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Met	195	200	205	
Leu	Val	Met	Ala	Leu	Ala	Asp	Leu	Asp	Thr	Leu	Tyr	Lys	Ser	Ala	Asp	210	215	220	
Ile	Thr	Ala	Ala	Leu	Thr	Met	Glu	Ala	Leu	Leu	Gly	Thr	Asp	Arg	Val	225	230	235	240
Leu	Ala	Pro	Glu	Leu	His	Ala	Pro	Ile	Arg	Pro	His	Pro	Gly	Gln	Ala	245	250	255	
Ala	Ser	Ala	Ala	Asn	Met	Ala	Ala	Val	Leu	Lys	Gly	Ser	Gly	Leu	Thr	260	265	270	
Gly	His	His	Gln	Asp	Asp	Ala	Pro	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Val	275	280	285	
Arg	Cys	Ala	Pro	Gln	Val	Ala	Gly	Ala	Gly	Arg	Asp	Thr	Met	Ala	His	290	295	300	
Ala	Gly	Leu	Val	Ala	Glu	Arg	Glu	Leu	Ala	Ala	Ala	Val	Asp	Asn	Pro	305	310	315	320
Val	Val	Leu	Pro	Asp	Gly	Arg	Val	Glu	Ser	Asn	Gly	Asn	Phe	His	Gly	325	330	335	
Ala	Pro	Val	Ala	Tyr	Val	Leu	Asp	Phe	Leu	Ala	Val	Ala	Val	Ala	Asp	340	345	350	
Leu	Gly	Ser	Ile	Ala	Glu	Arg	Arg	Thr	Asp	Arg	Leu	Leu	Asp	Lys	Asn	355	360	365	
Arg	Ser	His	Gly	Leu	Pro	Pro	Phe	Leu	Ala	Asp	Asp	Ala	Gly	Val	Asp	370	375	380	
Ser	Gly	Leu	Met	Ile	Ala	Gln	Tyr	Thr	Gln	Ala	Ala	Leu	Val	Gly	Glu	385	390	395	400
Leu	Lys	Arg	Leu	Ala	Val	Pro	Ala	Ser	Ala	Asp	Ser	Ile	Pro	Ser	Ser	405	410	415	
Ala	Met	Gln	Glu	Asp	His	Val	Ser	Met	Gly	Trp	Ser	Ala	Ala	Arg	Lys	420	425	430	
Leu	Arg	Thr	Ala	Val	Asp	Asn	Leu	Ala	Arg	Val	Ile	Ala	Val	Glu	Leu	435	440	445	

050345-07101

Tyr Ala Ala Thr Arg Ala Ile Gln Leu Arg Glu Gly Leu Thr Pro Ala
 450 455 460
 Pro Ala Ser Gln Ala Val Val Glu Ala Val Arg Ala Ala Val Glu Gly
 465 470 475 480
 Pro Gly Pro Asp Arg His Leu Ala Pro Asp Leu Ala Ala Ala Asp Ala
 485 490 495
 Phe Val Arg Ala Gly His Leu Val Ala Ala Ala Glu Ser Val Thr Gly
 500 505 510

Pro

<210> 45
 <211> 513
 <212> PRT
 <213> Streptomyces griseus

<400> 45
 Met Met Asp Met His Thr Val Val Val Gly Thr Ser Gly Thr Thr Ala
 1 5 10 15
 Glu Asp Val Val Ala Val Ala Arg His Gly Ala Arg Val Glu Leu Ser
 20 25 30
 Ala Ala Ala Val Glu Ala Leu Ala Ala Ala Arg Leu Ile Val Asp Ala
 35 40 45
 Leu Ala Ala Lys Pro Glu Pro Val Tyr Gly Val Ser Thr Gly Phe Gly
 50 55 60
 Ala Leu Ala Ser Arg His Ile Gly Thr Glu Leu Arg Ala Gln Leu Gln
 65 70 75 80
 Arg Asn Ile Val Arg Ser His Ala Ala Gly Met Gly Pro Arg Val Glu
 85 90 95
 Arg Glu Val Val Arg Ala Leu Met Phe Leu Arg Leu Lys Thr Val Ala
 100 105 110
 Ser Gly His Thr Gly Val Arg Pro Glu Val Ala Gln Thr Met Ala Asp
 115 120 125
 Val Leu Asn Ala Gly Ile Thr Pro Val Val His Glu Tyr Gly Ser Leu
 130 135 140
 Gly Cys Ser Gly Asp Leu Ala Pro Leu Ser His Cys Ala Leu Thr Leu
 145 150 155 160
 Met Gly Glu Gly Glu Ala Glu Gly Pro Asp Gly Thr Val Arg Pro Ala
 165 170 175
 Gly Glu Leu Leu Ala Ala His Gly Ile Ala Pro Val Glu Leu Arg Glu
 180 185 190

098345-031904

Lys	Glu	Gly 195	Leu	Ala	Leu	Leu	Asn 200	Gly	Thr	Asp	Gly	Met 205	Leu	Gly	Met
Leu	Val 210	Met	Ala	Leu	Ala	Asp 215	Leu	Arg	Asn	Leu	Tyr 220	Thr	Ser	Ala	Asp
Ile 225	Thr	Ala	Ala	Leu	Ser 230	Leu	Glu	Ala	Leu	Leu 235	Gly	Thr	Asp	Lys	Val 240
Leu	Ala	Pro	Glu	Leu 245	His	Ala	Pro	Ile	Arg 250	Pro	His	Pro	Gly	Gln 255	Gly
Val	Ser	Ala	Asp 260	Asn	Met	Ser	Arg	Val 265	Leu	Ala	Gly	Ser	Gly 270	Leu	Thr
Gly	His	His 275	Gln	Asp	Asp	Ala	Pro 280	Arg	Val	Gln	Asp	Ala 285	Tyr	Ser	Val
Arg	Cys 290	Ala	Pro	Gln	Val	Asn 295	Gly	Ala	Gly	Arg	Asp 300	Thr	Leu	Asp	His
Ala 305	Ala	Leu	Val	Ala	Gly 310	Arg	Glu	Leu	Ala	Ser 315	Ser	Val	Asp	Asn	Pro 320
Val	Val	Leu	Pro	Asp 325	Gly	Arg	Val	Glu	Ser 330	Asn	Gly	Asn	Phe	His 335	Gly
Ala	Pro	Val	Ala 340	Tyr	Val	Leu	Asp	Phe 345	Leu	Ala	Ile	Val	Ala 350	Ala	Asp
Leu	Gly	Ser 355	Ile	Cys	Glu	Arg	Arg 360	Thr	Asp	Arg	Leu	Leu 365	Asp	Lys	Asn
Arg	Ser 370	His	Gly	Leu	Pro	Pro 375	Phe	Leu	Ala	Asp	Asp 380	Ala	Gly	Val	Asp
Ser 385	Gly	Leu	Met	Ile	Ala 390	Gln	Tyr	Thr	Gln	Ala 395	Ala	Leu	Val	Ser	Glu 400
Met	Lys	Arg	Leu	Ala 405	Val	Pro	Ala	Ser	Ala 410	Asp	Ser	Ile	Pro	Ser 415	Ser
Ala	Met	Gln	Glu 420	Asp	His	Val	Ser	Met 425	Gly	Trp	Ser	Ala	Ala 430	Arg	Lys
Leu	Arg	Thr 435	Ala	Val	Asp	Asn	Leu 440	Ala	Arg	Ile	Val 445	Ala	Val	Glu	Leu
Tyr	Ala 450	Ala	Thr	Arg	Ala	Ile 455	Glu	Leu	Arg	Ala	Ala 460	Leu	Thr	Pro	Ala
Pro 465	Ala	Ser	Glu	Ala	Val 470	Val	Ala	Ala	Leu	Arg 475	Ala	Ala	Gly	Ala	Gly 480
Pro	Gly	Pro	Asp	Arg 485	Phe	Leu	Ala	Pro	Asp 490	Leu	Ala	Ala	Ala	Asp 495	Thr

Phe Val Arg Glu Gly Arg Leu Val Ala Ala Val Glu Pro Val Thr Gly
 500 505 510

Pro

<210> 46

<211> 513

<212> PRT

<213> Deinococcus radiodurans

<400> 46

Met Ala Ser Ala Pro Gln Ile Met Ile Leu Asp Arg Asp Leu Asn Leu
 1 5 10 15

Glu Gln Phe Ile Ser Val Val Arg His Gly Glu Gln Val Glu Leu Ser
 20 25 30

Ala Ala Ala Arg Glu Arg Ile Ala Arg Ala Arg Thr Val Ile Glu Gln
 35 40 45

Ile Val Glu Gly Asp Thr Pro Ile Tyr Gly Val Asn Thr Gly Phe Gly
 50 55 60

Lys Phe Glu Asn Val Gln Ile Asp Arg Ser Gln Leu Ala Gln Leu Gln
 65 70 75 80

His Asn Leu Ile Val Ser His Ala Ile Gly Met Gly Glu Pro Leu Pro
 85 90 95

Ala Glu Val Val Arg Gly Met Leu Leu Leu Arg Ala Gln Ser Leu Ser
 100 105 110

Leu Gly His Ser Gly Val Arg Val Glu Val Val Glu Leu Leu Leu Ala
 115 120 125

Leu Leu Asn Ala Asp Ala Leu Pro Val Val Pro Ser Gln Gly Ser Val
 130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Leu Ala Leu Gly Leu
 145 150 155 160

Ile Gly Leu Gly Asp Ile Thr Glu Tyr Gln Gly Gln Val Arg Pro Ala
 165 170 175

Ala Asp Val Leu Ala Glu Leu Gly Leu Ser Pro Val Gln Leu Gln Ala
 180 185 190

Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Leu Met Gly Ser Leu
 195 200 205

Leu Ala Leu Ala Leu His Asp Ala Gln Val Leu Leu Gly Thr Ala Asn
 210 215 220

Leu Ala Ala Ala Met Thr Val Glu Ala Arg Tyr Gly Ser His Arg Pro
 225 230 235 240

093345-07101
 103720-544860

Phe Gln Pro Asp Val His Val Gly Leu Arg Pro His Pro Gly Ala Leu
 245 250 255
 Ala Val Ala Ala Glu Leu Arg Glu Phe Leu Ala Gly Ser Glu Ile Ala
 260 265 270
 Pro Ser His Leu Thr Gly Asp Gly Lys Val Gln Asp Ala Tyr Ser Leu
 275 280 285
 Arg Ala Val Pro Gln Val His Gly Ala Thr Trp Asp Ala Leu Ala Gln
 290 295 300
 Ala Glu Arg Val Leu Ala Val Glu Phe Ala Ser Val Thr Asp Asn Pro
 305 310 315 320
 Leu Ile Phe Pro Thr Gly Glu Val Val Ser Gly Gly Asn Phe His Gly
 325 330 335
 Gln Pro Leu Ala Val Thr Ile Asp Ala Leu Lys Val Ala Val Ala Glu
 340 345 350
 Leu Gly Ser Ile Ser Glu Arg Arg Thr Glu Gln Leu Leu Asn Pro Ala
 355 360 365
 Leu Ser Arg Gly Leu Pro Ala Phe Leu Thr Pro Asn Gly Gly Leu Asn
 370 375 380
 Ser Gly Phe Met Ile Ala Gln Tyr Thr Ser Ala Ala Leu Val Ser Glu
 385 390 395 400
 Asn Lys Val Leu Ser His Pro Ala Ser Val Asp Ser Ile Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Gly Ala His Ala Ala Arg Gln
 420 425 430
 Leu Arg Gln Ile Val Ala Asn Val Gln Thr Val Leu Ser Ile Glu Leu
 435 440 445
 Leu Cys Ala Ala Gln Gly Leu Asp Phe Gln Gln Pro Leu Arg Ala Gly
 450 455 460
 Arg Gly Val Gln Ala Ala Tyr Glu Tyr Val Arg Thr Phe Val Pro Thr
 465 470 475 480
 Leu Thr Glu Asp Arg Tyr Phe Arg Pro Asp Leu Leu Arg Leu Arg Gly
 485 490 495
 Glu Leu Val Ser Gly Arg Val Ala Gln Ala Ala Asp Thr Gln Ala Pro
 500 505 510

Ala

<210> 47
 <211> 513
 <212> PRT

09833745 071001

<213> Agrobacterium rhizogenes

<400> 47

Met	Ala	Ser	Ala	Pro	Gln	Ile	Thr	Leu	Gly	Leu	Ser	Gly	Val	Pro	Leu	1	5	10	15
His	His	Leu	Ala	Asp	Ile	Tyr	Trp	Asn	Asn	Gly	Ser	Ala	Lys	Leu	Asp	20	25	30	
Pro	Ser	Phe	Asp	Ala	Ala	Val	Leu	Lys	Gly	Ala	Ala	Arg	Ile	Ala	Glu	35	40	45	
Ile	Ala	Ala	Gly	Asn	Ala	Pro	Val	Tyr	Gly	Ile	Asn	Thr	Gly	Phe	Gly	50	55	60	
Lys	Leu	Ala	Ser	Ile	Lys	Ile	Asp	Ala	Ala	Asp	Leu	Ala	Thr	Leu	Gln	65	70	75	80
Arg	Asn	Leu	Ile	Leu	Ser	His	Cys	Cys	Gly	Val	Gly	Ala	Pro	Leu	Pro	85	90	95	
Glu	Asn	Val	Val	Arg	Leu	Ile	Met	Ala	Leu	Lys	Leu	Ile	Ser	Leu	Gly	100	105	110	
Arg	Gly	Ala	Ser	Gly	Val	Arg	Ile	Glu	Leu	Ile	Arg	Leu	Ile	Glu	Gly	115	120	125	
Met	Leu	Glu	Lys	Gly	Val	Ile	Pro	Val	Ile	Pro	Glu	Lys	Gly	Ser	Val	130	135	140	
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Ala	Thr	Met	145	150	155	160
Met	Gly	Glu	Gly	Glu	Ala	Phe	Asp	Tyr	Gln	Gly	Val	Gln	Met	Pro	Ser	165	170	175	
Lys	Asp	Ala	Leu	Ala	Lys	Ala	Gly	Leu	Ser	Pro	Val	Val	Leu	Ala	Ala	180	185	190	
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Thr	Ser	Thr	Ala	Leu	195	200	205	
Ala	Leu	Ala	Gly	Leu	Phe	Arg	Ala	His	Arg	Ala	Ala	Gln	Ser	Ala	Leu	210	215	220	
Val	Thr	Gly	Ala	Leu	Ser	Thr	Asp	Ala	Ala	Met	Gly	Ser	Ser	Ala	Pro	225	230	235	240
Phe	His	Pro	Asp	Ile	His	Thr	Pro	Leu	Arg	Gly	His	Lys	Gly	Gln	Ile	245	250	255	
Asp	Ala	Gly	Ser	Ala	Leu	Arg	Asn	Leu	Leu	Gln	Gly	Ser	Glu	Ile	Arg	260	265	270	
Glu	Ser	His	Ile	Glu	Gly	Asp	Glu	Arg	Val	Gln	Asp	Pro	Tyr	Cys	Ile	275	280	285	

093345-071901

Arg Cys Gln Pro Gln Val Asp Gly Ala Cys Leu Asp Leu Leu Ala Ser
 290 295 300
 Val Ala Arg Thr Leu Glu Ile Glu Ala Asn Ala Val Thr Asp Asn Pro
 305 310 315 320
 Leu Val Leu Ser Asp Asn Ser Val Val Ser Gly Gly Asn Phe His Ala
 325 330 335
 Glu Pro Val Ala Phe Ala Ala Asp Gln Thr Ala Leu Ala Val Cys Glu
 340 345 350
 Ile Gly Ala Ile Ala Gln Arg Arg Ile Ala Leu Leu Val Asp Pro Ala
 355 360 365
 Leu Ser Tyr Gly Leu Pro Ala Phe Leu Ser Lys Lys Pro Gly Leu Asn
 370 375 380
 Ser Gly Leu Met Ile Ala Glu Val Thr Ser Ala Ala Leu Met Ser Glu
 385 390 395 400
 Asn Lys Gln Met Ser His Pro Ala Ser Val Asp Ser Thr Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Ala Cys His Gly Ala Arg Arg
 420 425 430
 Leu Leu Ala Met Thr Asp Asn Leu Phe Gly Ile Leu Gly Ile Glu Ala
 435 440 445
 Leu Ala Ala Val Gln Gly Val Glu Leu Arg Gly Pro Leu Lys Thr Ser
 450 455 460
 Pro Glu Leu Glu Lys Ala Ala Ala Val Leu Arg Ser Ala Val Pro Val
 465 470 475 480
 Leu Glu Asp Asp Arg Tyr Met Ala Thr Asp Leu Lys Ala Ala Ile Glu
 485 490 495
 Val Val Ala Ser Gly Ala Leu Val Ser Ala Ile Ser Ser Gly Leu Pro
 500 505 510

Val

<210> 48
 <211> 513
 <212> PRT
 <213> Agrobacterium rhizogenes

<400> 48
 Met Ala Ser Ala Pro Gln Ile Thr Leu Gly Leu Ser Gly Val Pro Leu
 1 5 10 15
 His His Leu Ala Asp Ile Tyr Trp Asn Asn Gly Ser Ala Lys Leu Asp
 20 25 30

090314E071B04

Pro	Ser	Phe 35	Asp	Ala	Ala	Val	Leu 40	Lys	Gly	Ala	Ala	Arg 45	Ile	Ala	Glu
Ile	Ala 50	Ala	Gly	Asn	Ala	Pro 55	Val	Tyr	Gly	Ile	Asn 60	Thr	Gly	Phe	Gly
Lys 65	Leu	Ala	Ser	Ile	Lys 70	Ile	Asp	Ala	Ala	Asp 75	Leu	Ala	Thr	Leu	Gln 80
Arg	Asn	Leu	Ile	Leu 85	Ser	His	Cys	Cys	Gly 90	Val	Gly	Ala	Pro	Leu 95	Pro
Glu	Asn	Val	Val 100	Arg	Leu	Ile	Met	Ala 105	Leu	Lys	Leu	Ile	Ser 110	Leu	Gly
Arg	Gly	Ala 115	Ser	Gly	Val	Arg	Ile 120	Glu	Leu	Ile	Arg	Leu 125	Ile	Glu	Gly
Met	Leu 130	Glu	Lys	Gly	Val	Ile 135	Pro	Val	Ile	Pro	Glu 140	Lys	Gly	Ser	Val
Gly 145	Ala	Ser	Gly	Asp	Leu 150	Ala	Pro	Leu	Ala	His 155	Met	Ser	Ala	Thr	Met 160
Met	Gly	Glu	Gly	Glu 165	Ala	Phe	Asp	Tyr	Gln 170	Gly	Val	Gln	Met	Pro 175	Ser
Lys	Asp	Ala	Leu 180	Ala	Lys	Ala	Gly	Leu 185	Ser	Pro	Val	Val	Leu 190	Ala	Ala
Lys	Glu	Gly 195	Leu	Ala	Leu	Ile	Asn 200	Gly	Thr	Gln	Thr	Ser 205	Thr	Ala	Leu
Ala	Leu 210	Ala	Gly	Leu	Phe	Arg 215	Ala	His	Arg	Ala	Ala 220	Gln	Ser	Ala	Leu
Val 225	Thr	Gly	Ala	Leu	Ser 230	Thr	Asp	Ala	Ala	Met 235	Gly	Ser	Ser	Ala	Pro 240
Phe	His	Pro	Asp	Ile 245	His	Thr	Pro	Leu	Arg 250	Gly	His	Lys	Gly	Gln 255	Ile
Asp	Ala	Gly	Ser 260	Ala	Leu	Arg	Asn 265	Leu	Leu	Gln	Gly	Ser	Glu 270	Ile	Arg
Glu	Ser	His 275	Ile	Glu	Gly	Asp 280	Glu	Arg	Val	Gln	Asp	Pro 285	Tyr	Cys	Ile
Arg	Cys 290	Gln	Pro	Gln	Val	Asp 295	Gly	Ala	Cys	Leu	Asp 300	Leu	Leu	Ala	Ser
Val 305	Ala	Arg	Thr	Leu	Glu 310	Ile	Glu	Ala	Asn	Ala 315	Val	Thr	Asp	Asn	Pro 320
Leu	Val	Leu	Ser	Asp 325	Asn	Ser	Val	Val	Ser 330	Gly	Gly	Asn	Phe	His 335	Ala

Glu Pro Val Ala Phe Ala Ala Asp Gln Thr Ala Leu Ala Val Cys Glu
 340 345 350
 Ile Gly Ala Ile Ala Gln Arg Arg Ile Ala Leu Leu Val Asp Pro Ala
 355 360 365
 Leu Ser Tyr Gly Leu Pro Ala Phe Leu Ser Lys Lys Pro Gly Leu Asn
 370 375 380
 Ser Gly Leu Met Ile Ala Glu Val Thr Ser Ala Ala Leu Met Ser Glu
 385 390 395 400
 Asn Lys Gln Met Ser His Pro Ala Ser Val Asp Ser Thr Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Ala Cys His Gly Ala Arg Arg
 420 425 430
 Leu Leu Ala Met Thr Asp Asn Leu Phe Gly Ile Leu Gly Ile Glu Ala
 435 440 445
 Leu Ala Ala Val Gln Gly Val Glu Leu Arg Gly Pro Leu Lys Thr Ser
 450 455 460
 Pro Glu Leu Glu Lys Ala Ala Ala Val Leu Arg Ser Ala Val Pro Val
 465 470 475 480
 Leu Glu Asp Asp Arg Tyr Met Ala Thr Asp Leu Lys Ala Ala Ile Glu
 485 490 495
 Val Val Ala Ser Gly Ala Leu Val Ser Ala Ile Ser Ser Gly Leu Pro
 500 505 510
 Val

<210> 49
 <211> 513
 <212> PRT
 <213> Bacillus subtilis

<400> 49
 Met Ala Ser Ala Pro Met Val Thr Leu Asp Gly Ser Ser Leu Thr Thr
 1 5 10 15
 Ala Asp Val Ala Arg Val Leu Phe Asp Phe Glu Glu Ala Ala Ala Ser
 20 25 30
 Glu Glu Ser Met Glu Arg Val Lys Lys Ser Arg Ala Ala Val Glu Arg
 35 40 45
 Ile Val Arg Asp Glu Lys Thr Ile Tyr Gly Ile Asn Thr Gly Phe Gly
 50 55 60
 Lys Phe Ser Asp Val Leu Ile Gln Lys Glu Asp Ser Ala Ala Leu Gln
 65 70 75 80

0983745-071504

Leu	Asn	Leu	Ile	Leu	Ser	His	Ala	Cys	Gly	Val	Gly	Asp	Pro	Phe	Pro
				85					90					95	
Glu	Cys	Val	Ser	Arg	Ala	Met	Leu	Leu	Leu	Arg	Ala	Asn	Ala	Leu	Leu
			100					105					110		
Lys	Gly	Phe	Ser	Gly	Val	Arg	Ala	Glu	Leu	Ile	Glu	Gln	Leu	Leu	Ala
		115					120					125			
Phe	Leu	Asn	Lys	Arg	Val	His	Pro	Val	Ile	Pro	Gln	Gln	Gly	Ser	Leu
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Ala	Leu
145					150					155					160
Ile	Gly	Gln	Gly	Glu	Val	Phe	Asp	Phe	Glu	Gly	Glu	Arg	Met	Pro	Ala
				165					170					175	
Met	Thr	Gly	Leu	Lys	Lys	Ala	Gly	Ile	Gln	Pro	Val	Thr	Leu	Thr	Ser
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Ala	Met	Thr	Ala	Met
		195					200					205			
Gly	Val	Val	Ala	Tyr	Ile	Glu	Ala	Glu	Lys	Leu	Ala	Tyr	Gln	Thr	Glu
	210					215					220				
Arg	Ile	Ala	Ser	Leu	Thr	Ile	Glu	Gly	Leu	Gln	Gly	Ile	Ile	Asp	Ala
225					230					235					240
Phe	Asp	Glu	Asp	Ile	His	Leu	Ala	Leu	Arg	Gly	Tyr	Gln	Glu	Gln	Ile
				245					250					255	
Asp	Val	Ala	Glu	Arg	Ile	Arg	Phe	Tyr	Leu	Ser	Asp	Ser	Gly	Leu	Thr
			260					265					270		
Thr	Ser	His	Arg	Gln	Gly	Glu	Leu	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu
		275					280					285			
Arg	Cys	Ile	Pro	Gln	Val	His	Gly	Ala	Thr	Trp	Gln	Thr	Leu	Gly	Tyr
	290					295					300				
Val	Lys	Glu	Lys	Leu	Glu	Ile	Glu	Met	Asn	Ala	Ala	Thr	Asp	Asn	Pro
305					310					315					320
Leu	Ile	Phe	Asn	Asp	Gly	Asp	Val	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly
				325					330					335	
Gln	Pro	Ile	Ala	Phe	Ala	Met	Asp	Phe	Leu	Lys	Ile	Ala	Ile	Ser	Glu
			340					345					350		
Leu	Ala	Asn	Ile	Ala	Glu	Arg	Arg	Ile	Glu	Arg	Leu	Val	Asn	Pro	Gln
		355					360					365			
Leu	Asn	Arg	Asp	Leu	Pro	Pro	Phe	Leu	Ser	Pro	His	Pro	Gly	Leu	Gln
	370					375					380				

Ser Gly Ala Met Ile Met Gln Tyr Ala Ala Ala Ser Leu Val Ser Glu
385 390 395 400

Asn Lys Thr Leu Ala His Pro Ala Ser Val Asp Ser Ile Pro Ser Ser
405 410 415

Ala Asn Gln Glu Asp His Val Ser Met Gly Thr Ile Ala Ala Arg His
420 425 430

Ala Tyr Gln Val Ile Ala Asn Thr Arg Arg Val Ile Ala Ile Glu Ala
435 440 445

Ile Cys Ala Leu Gln Ala Val Glu Tyr Arg Gly Ile Glu His Ala Ala
450 455 460

Ser Tyr Thr Lys Gln Leu Phe Gln Glu Met Arg Lys Val Val Pro Ser
465 470 475 480

Ile Gln Gln Asp Arg Val Phe Ser Tyr Asp Ile Glu Arg Leu Thr Asp
485 490 495

Trp Leu Lys Lys Glu Ser Leu Ile Pro Asp His Gln Asn Lys Glu Leu
500 505 510

Arg

<210> 50

<211> 513

<212> PRT

<213> *Vibrio cholerae*

<400> 50

Met Ala Ser Met Leu His Leu Met Ile Lys Pro Gly Gln Leu Ser Leu
1 5 10 15

Lys Gln Leu Arg Gln Val Ser Arg Ser Pro Val Val Leu Ser Leu Asp
20 25 30

Pro Glu Ala Ile Pro Ala Ile Ala Glu Ser Ala Gln Val Val Glu Gln
35 40 45

Val Ile Ser Glu Gly Arg Thr Val Tyr Gly Ile Asn Thr Gly Phe Gly
50 55 60

Leu Leu Ala Asn Thr Lys Ile Ala Pro Gln Asp Leu Glu Thr Leu Gln
65 70 75 80

Lys Ser Ile Val Leu Ser His Ala Ala Gly Ile Gly Glu Leu Met Ser
85 90 95

Asp Glu Thr Val Arg Leu Met Met Leu Leu Lys Ile Asn Ser Leu Ala
100 105 110

Arg Gly Tyr Ser Gly Ile Arg Leu Glu Val Ile Gln Ala Leu Ile Glu
115 120 125

0983745-07180T

Leu	Val	Asn	Asn	Gln	Ile	Tyr	Pro	Cys	Val	Pro	Lys	Lys	Gly	Ser	Val
130						135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Thr	Val	Leu
145					150					155					160
Leu	Gly	Glu	Gly	Gln	Ala	Arg	Asp	Tyr	Asn	Gly	Lys	Ile	Ile	Ser	Gly
				165					170					175	
Leu	Glu	Ala	Met	Lys	Ile	Ala	Gly	Leu	Glu	Pro	Ile	Thr	Leu	Ala	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Gln	Ala	Ser	Thr	Ala	Phe
		195					200					205			
Ala	Leu	Glu	Gly	Leu	Phe	Val	Ala	Glu	Asp	Leu	Phe	Ala	Ser	Ala	Thr
	210					215					220				
Val	Cys	Gly	Ala	Met	Ser	Val	Glu	Ala	Ala	Leu	Gly	Ser	Arg	Arg	Pro
225					230					235					240
Phe	Asp	Pro	Arg	Ile	His	Arg	Pro	Val	Arg	Gly	His	Arg	Thr	Gln	Met
				245					250					255	
Asp	Ala	Ala	Thr	Ala	Tyr	Arg	His	Leu	Leu	Val	Ser	Ser	Glu	Ile	Gly
			260					265					270		
Gln	Ser	His	Ser	Asn	Cys	Glu	Gly	Lys	Val	Gln	Asp	Pro	Tyr	Ser	Leu
		275					280					285			
Arg	Cys	Gln	Pro	Gln	Val	Met	Gly	Ala	Cys	Leu	Gln	Gln	Ile	Arg	Ser
	290					295					300				
Ala	Ala	Glu	Val	Leu	Glu	Val	Glu	Ala	Asn	Ser	Val	Ser	Asp	Asn	Pro
305					310					315					320
Leu	Val	Phe	Ala	Asp	Gly	Asp	Ile	Ile	Ser	Gly	Gly	Asn	Phe	His	Ala
				325					330					335	
Glu	Pro	Val	Ala	Met	Ala	Ala	Asp	Asn	Leu	Ala	Leu	Ala	Ile	Ala	Glu
			340					345					350		
Ile	Gly	Ser	Leu	Ser	Glu	Arg	Arg	Met	Ala	Leu	Leu	Ile	Asp	Ser	Ala
		355					360					365			
Leu	Ser	Lys	Asp	Leu	Pro	Pro	Phe	Leu	Val	Asp	Asn	Gly	Gly	Val	Asn
	370					375					380				
Ser	Gly	Phe	Met	Ile	Ala	Gln	Val	Thr	Ala	Ala	Ala	Leu	Ala	Ser	Glu
385					390					395					400
Asn	Lys	Thr	Leu	Ala	His	Pro	Ala	Ser	Val	Asp	Ser	Leu	Pro	Thr	Ser
				405					410					415	
Ala	Asn	Gln	Glu	Asp	His	Val	Ser	Met	Ala	Thr	Phe	Ala	Ala	Arg	Arg
			420					425					430		

0933745 071801

Leu Arg Asp Met Gly Glu Asn Thr Arg Gly Ile Leu Ala Val Glu Tyr
435 440 445

Leu Ala Ala Ala Gln Gly Leu Asp Phe Arg Ala Pro Leu Lys Ser Ser
450 455 460

Pro Arg Ile Glu Glu Ala Arg Gln Ile Leu Arg Glu Lys Val Pro Phe
465 470 475 480

Tyr Asp Lys Asp Arg Tyr Phe Ala Pro Asp Ile Glu Lys Ala Asn Ala
485 490 495

Leu Leu Ala Gln Leu Ala Val His Asn Arg Leu Met Pro Asp Gln Leu
500 505 510

Leu

<210> 51

<211> 513

<212> PRT

<213> Pseudomonas aeruginosa

<400> 51

Met Ala Ser Ala Met Ser Leu His Leu Lys Pro Gly Gln Leu Thr Leu
1 5 10 15

Ala Asp Leu Arg Gln Ala Tyr Leu Ala Pro Val Arg Leu Ser Leu Asp
20 25 30

Pro Ser Ala Asp Ala Pro Ile Ala Ala Ser Val Ala Cys Val Glu Asn
35 40 45

Ile Ile Ala Glu Gly Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly
50 55 60

Leu Leu Ala Ser Thr Arg Ile Ser Pro Ala Asp Leu Glu Lys Leu Gln
65 70 75 80

Arg Ser Ile Val Leu Ser His Ala Ala Gly Val Gly Glu Ala Leu Asp
85 90 95

Asp Ala Met Val Arg Leu Val Met Leu Leu Lys Val Asn Ser Leu Ala
100 105 110

Arg Gly Phe Ser Gly Ile Arg Arg Lys Val Ile Asp Ala Leu Ile Ala
115 120 125

Leu Ile Asn Ala Glu Val Tyr Pro His Ile Pro Leu Lys Gly Ser Val
130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Leu Val Leu
145 150 155 160

Ile Gly Glu Ser Arg Ala Arg His Ala Arg Gly Glu Trp Leu Pro Ala
165 170 175

0933745-071604

Ala	Glu	Ala	Leu	Ala	Val	Ala	Gly	Leu	Glu	Pro	Leu	Thr	Leu	Ala	Ala		
			180					185					190				
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Gln	Val	Ser	Thr	Ala	Tyr		
		195					200					205					
Ala	Leu	Arg	Gly	Leu	Phe	Glu	Ala	Glu	Asp	Leu	Phe	Ala	Ala	Ala	Thr		
		210				215					220						
Val	Cys	Gly	Gly	Leu	Ser	Val	Glu	Ala	Met	Leu	Gly	Ser	Arg	Ala	Pro		
225					230					235					240		
Phe	Asp	Ala	Arg	Ile	His	Ala	Ala	Leu	Arg	Gly	Gln	Arg	Gly	Gln	Ile		
				245					250					255			
Asp	Val	Ala	Ala	Ala	Tyr	Arg	Asp	Leu	Leu	Ala	Ser	Ser	Glu	Val	Ala		
			260					265					270				
Arg	Ser	His	Glu	Lys	Cys	Asp	Gly	Lys	Val	Gln	Asp	Pro	Tyr	Ser	Leu		
		275					280					285					
Arg	Cys	Gln	Pro	Gln	Val	Met	Gly	Ala	Cys	Leu	Thr	Gln	Met	Arg	Gln		
	290					295					300						
Ala	Ala	Glu	Val	Leu	Glu	Ile	Glu	Ala	Asn	Ala	Val	Ser	Asp	Asn	Pro		
305					310				315						320		
Leu	Val	Phe	Ala	Ala	Gly	Asp	Val	Ile	Ser	Gly	Gly	Asn	Phe	His	Ala		
				325					330					335			
Glu	Pro	Val	Ala	Met	Ala	Ala	Asp	Asn	Leu	Ala	Leu	Ala	Leu	Ala	Glu		
			340					345					350				
Ile	Gly	Ser	Leu	Ser	Glu	Arg	Arg	Ile	Ser	Leu	Met	Met	Asp	Met	His		
		355					360					365					
Met	Ser	Gln	Asp	Leu	Pro	Pro	Phe	Leu	Val	Ala	Asn	Gly	Gly	Val	Asn		
	370					375					380						
Ser	Gly	Phe	Met	Ile	Ala	Gln	Val	Thr	Ala	Ala	Ala	Leu	Ala	Ser	Asp		
385					390					395					400		
Asn	Lys	Ala	Leu	Ala	His	Pro	Ala	Ser	Val	Asp	Ser	Leu	Pro	Thr	Ser		
				405					410					415			
Ala	Asn	Gln	Glu	Asp	His	Val	Ser	Met	Ala	Pro	Asn	Ala	Gly	Lys	Arg		
			420					425					430				
Leu	Trp	Ala	Met	Ala	Glu	Asn	Val	Arg	Gly	Ile	Leu	Ala	Val	Glu	Trp		
		435					440					445					
Leu	Gly	Ala	Cys	Gln	Gly	Leu	Asp	Phe	Arg	Glu	Gly	Leu	Lys	Ser	Ser		
	450					455					460						
Pro	Lys	Leu	Glu	Gln	Ala	Arg	Arg	Leu	Leu	Arg	Asp	Lys	Val	Pro	Tyr		
465					470					475					480		

098345
071001

Tyr Gln Glu Asp Arg Phe Phe Ala Pro Asp Ile Glu Ala Ala Ser Gln
485 490 495

Leu Leu Ala Ser Gly Cys Leu Asn Ala Leu Leu Pro Ala Arg Leu Leu
500 505 510

Pro

<210> 52

<211> 513

<212> PRT

<213> Bacillus halodurans

<400> 52

Met Ala Met Thr Asn Leu Lys Leu Leu Asp Gly Arg Ser Leu Ser Leu
1 5 10 15

His Asp Leu His Arg Ile Ile Tyr Glu Gly Glu Thr Val Gly Ala Ser
20 25 30

Asp Glu Ser Met Glu Lys Val Lys Gln Ser Arg Lys Ala Val Glu Gln
35 40 45

Ile Val Ala Asp Glu Lys Ile Ile Tyr Gly Ile Thr Thr Gly Phe Gly
50 55 60

Lys Phe Ser Asp Ile Phe Ile Asp Pro Asp Asp Val Glu Asn Leu Gln
65 70 75 80

His Asn Leu Ile Tyr Ser His Ala Cys Gly Val Gly Ser Pro Phe Pro
85 90 95

Glu Thr Val Ser Arg Thr Met Leu Val Leu Arg Ala Asn Ala Leu Leu
100 105 110

Lys Gly Phe Ser Gly Val Arg Pro Leu Val Ile Glu Arg Leu Leu Ala
115 120 125

Leu Val Asn Ala Asn Ile His Pro Val Ile Pro Gln Gln Gly Ser Leu
130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Val Leu
145 150 155 160

Leu Gly Glu Gly Glu Val Phe Asp Tyr Lys Gly Thr Lys Thr Lys Ala
165 170 175

Ser Phe Ala Leu Lys Glu Glu Glu Ile Glu Pro Ile Thr Leu Thr Ala
180 185 190

Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Ala Met Thr Ala Met
195 200 205

Gly Val Ile Ala Tyr Leu Glu Ala Glu Lys Leu Ala Phe Gln Ser Glu
210 215 220

093345-071901
TOP20-5423360

[illegible]

<210> 53
 <211> 513
 <212> PRT
 <213> Pseudomonas putida

<400> 53

Met	Ala	Ser	Ala	Thr	Glu	Leu	Thr	Leu	Lys	Pro	Gly	Thr	Leu	Thr	Leu
1				5					10					15	
Ala	Gln	Leu	Arg	Ala	Ile	His	Ala	Ala	Pro	Val	Arg	Leu	Gln	Leu	Asp
			20					25					30		
Ala	Ser	Ala	Ala	Pro	Ala	Ile	Asp	Ala	Ser	Val	Ala	Cys	Val	Glu	Gln
		35					40					45			
Ile	Ile	Ala	Glu	Asp	Arg	Thr	Ala	Tyr	Gly	Ile	Asn	Thr	Gly	Phe	Gly
	50					55					60				
Leu	Leu	Ala	Ser	Thr	Arg	Ile	Ala	Ser	His	Asp	Leu	Glu	Asn	Leu	Gln
65					70					75					80
Arg	Ser	Leu	Val	Leu	Ser	His	Ala	Ala	Gly	Ile	Gly	Ala	Pro	Leu	Asp
				85					90					95	
Asp	Asp	Leu	Val	Arg	Leu	Ile	Met	Val	Leu	Lys	Ile	Asn	Ser	Leu	Ser
			100					105					110		
Arg	Gly	Phe	Ser	Gly	Ile	Arg	Arg	Lys	Val	Ile	Asp	Ala	Leu	Ile	Ala
		115					120					125			
Leu	Val	Asn	Ala	Glu	Val	Tyr	Pro	His	Ile	Pro	Leu	Lys	Gly	Ser	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Leu	Val	Leu
145					150					155					160
Leu	Gly	Glu	Gly	Lys	Ala	Arg	Asp	Tyr	Lys	Gly	Gln	Trp	Leu	Ser	Ala
				165					170					175	
Thr	Glu	Ala	Leu	Ala	Val	Ala	Gly	Leu	Glu	Pro	Leu	Thr	Leu	Ala	Ala
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Gln	Ala	Ser	Thr	Ala	Tyr
		195					200					205			
Ala	Leu	Arg	Gly	Leu	Phe	Tyr	Ala	Glu	Asp	Leu	Tyr	Ala	Ala	Ala	Ile
	210					215					220				
Ala	Cys	Gly	Gly	Leu	Ser	Val	Glu	Ala	Val	Leu	Gly	Ser	Arg	Ser	Pro
225					230					235					240
Phe	Asp	Ala	Arg	Ile	His	Glu	Ala	Leu	Arg	Gly	Gln	Arg	Gly	Gln	Ile
				245					250					255	
Asp	Thr	Ala	Ala	Cys	Phe	Arg	Asp	Leu	Leu	Gly	Asp	Ser	Ser	Glu	Val
			260					265					270		

093746 04 FEB 69

Ser Ser His Lys Asn Cys Asp Gly Lys Val Gln Asp Pro Tyr Ser Leu
 275 280 285
 Arg Cys Gln Pro Gln Val Met Gly Ala Cys Leu Thr Gln Leu Arg Gln
 290 295 300
 Ala Ala Glu Val Leu Gly Ile Glu Ala Asn Ala Val Ser Asp Asn Pro
 305 310 315 320
 Leu Val Phe Ala Ala Gly Asp Val Ile Ser Gly Gly Asn Phe His Ala
 325 330 335
 Glu Pro Val Ala Met Ala Ala Asp Asn Leu Ala Leu Ala Ile Ala Glu
 340 345 350
 Ile Gly Ser Leu Ser Glu Arg Arg Ile Ser Leu Met Met Asp Lys His
 355 360 365
 Met Ser Gln Asp Leu Pro Pro Phe Leu Val Glu Asn Gly Gly Val Asn
 370 375 380
 Ser Gly Phe Met Ile Ala Gln Val Thr Ala Ala Ala Leu Ala Ser Glu
 385 390 395 400
 Asn Lys Ala Leu Ser His Pro His Ser Val Asp Ser Leu Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Ala Pro Ala Ala Gly Lys Arg
 420 425 430
 Leu Trp Glu Met Ala Glu Asn Thr Arg Gly Val Leu Ala Ile Glu Trp
 435 440 445
 Leu Gly Ala Cys Gln Gly Leu Asp Leu Arg Lys Gly Leu Lys Thr Ser
 450 455 460
 Ala Lys Leu Glu Lys Ala Arg Gln Ala Leu Arg Ser Glu Val Ala His
 465 470 475 480
 Tyr Asp Arg Asp Arg Phe Phe Ala Pro Asp Ile Glu Lys Ala Val Glu
 485 490 495
 Leu Leu Ala Lys Gly Ser Leu Thr Gly Leu Leu Pro Ala Gly Leu Pro
 500 505 510

Ser

<210> 54
 <211> 513
 <212> PRT
 <213> Rhizobium meliloti

<400> 54
 Met Ala Ser Ala Pro Gln Ile Thr Leu Arg Pro Gly Ser Val Pro Leu
 1 5 10 15

03040506070809101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100

Ser	Asp	Leu	Glu	Thr	Ile	Tyr	Trp	Thr	Gly	Ala	Pro	Ala	Arg	Leu	Asp
			20					25					30		
Ala	Ala	Phe	Asp	Ala	Gly	Ile	Ala	Lys	Ala	Ala	Ala	Arg	Ile	Ala	Glu
		35					40					45			
Ile	Val	Ala	Gly	Asn	Ala	Pro	Val	Tyr	Gly	Ile	Asn	Thr	Gly	Phe	Gly
	50					55					60				
Lys	Leu	Ala	Ser	Ile	Lys	Ile	Asp	Ser	Ser	Asp	Val	Ala	Thr	Leu	Gln
65					70					75					80
Arg	Asn	Leu	Ile	Leu	Ser	His	Cys	Cys	Gly	Val	Gly	Gln	Pro	Leu	Thr
				85					90					95	
Glu	Asp	Ile	Val	Arg	Leu	Ile	Met	Ala	Leu	Lys	Leu	Ile	Ser	Leu	Gly
			100					105					110		
Arg	Gly	Ala	Ser	Gly	Val	Arg	Leu	Glu	Leu	Val	Arg	Leu	Ile	Glu	Ala
		115					120					125			
Met	Leu	Asp	Lys	Gly	Val	Ile	Pro	Leu	Ile	Pro	Glu	Lys	Gly	Ser	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ala	Ala	Val	Met
145					150					155					160
Met	Gly	His	Gly	Glu	Ala	Phe	Phe	Ala	Gly	Glu	Arg	Met	Lys	Gly	Asp
				165					170					175	
Ala	Ala	Leu	Lys	Ala	Glu	Ala	Gly	Leu	Ser	Pro	Val	Thr	Leu	Ala	Ala
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Val	Ser	Thr	Ala	Leu
		195					200					205			
Ala	Leu	Ala	Gly	Leu	Phe	Arg	Ala	His	Arg	Ala	Gly	Gln	Ala	Ala	Leu
	210					215					220				
Ile	Thr	Gly	Ala	Leu	Ser	Thr	Asp	Ala	Ala	Met	Gly	Ser	Ser	Ala	Pro
225					230					235					240
Phe	His	Pro	Asp	Ile	Gln	His	Cys	Ala	Ala	Ile	Arg	Ala	Arg	Ser	Thr
				245					250					255	
Arg	Ala	Ala	Ala	Asn	Leu	Arg	Gln	Leu	Leu	Thr	Gly	Ser	Pro	Ile	Arg
			260					265					270		
Gln	Ser	His	Ile	Glu	Gly	Asp	Glu	Arg	Val	Gln	Asp	Pro	Tyr	Cys	Ile
		275					280					285			
Arg	Cys	Gln	Pro	Gln	Val	Asp	Gly	Ala	Cys	Leu	Asp	Leu	Leu	Arg	Ser
	290					295					300				
Val	Ala	Ala	Thr	Leu	Thr	Ile	Glu	Ala	Asn	Ala	Val	Thr	Asp	Asn	Pro
305					310					315					320

090345-071304

Leu Val Leu Ser Asp Asn Ser Val Val Ser Gly Gly Asn Phe His Ala
 325 330 335
 Glu Pro Val Ala Phe Ala Ala Asp Gln Ile Ala Leu Ala Val Cys Glu
 340 345 350
 Ile Gly Ala Ile Ser Gln Arg Arg Ile Ala Leu Leu Val Asp Pro Ala
 355 360 365
 Leu Ser Leu Arg Leu Pro Ala Phe Leu Ala Lys Lys Pro Gly Leu Asn
 370 375 380
 Ser Gly Leu Met Ile Ala Glu Val Thr Ser Ala Ala Leu Met Ser Glu
 385 390 395 400
 Asn Lys Gln Leu Ser His Pro Ala Ser Val Asp Ser Thr Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Ala Cys His Gly Ala Arg Arg
 420 425 430
 Leu Leu Gln Met Thr Glu Asn Leu Phe Ser Ile Ile Gly Ile Glu Ala
 435 440 445
 Leu Ala Ala Val Gln Gly Ile Glu Phe Arg Ala Pro Leu Thr Thr Ser
 450 455 460
 Pro Glu Leu Gln Lys Ala Ala Ala Val Arg Gly Val Ser Ser Ser
 465 470 475 480
 Ile Glu Glu Asp Arg Tyr Met Ala Asp Asp Leu Lys Ala Ala Gly Asp
 485 490 495
 Leu Val Ala Ser Gly Arg Leu Ala Ala Ala Val Ser Ala Gly Leu Pro
 500 505 510

Lys

<210> 55
 <211> 513
 <212> PRT
 <213> Pseudomonas aeruginosa

<400> 55
 Met Ser Asp Leu Pro Ser Val Val Phe Gly Asp Gly Pro Leu Arg Trp
 1 5 10 15
 Gln Glu Leu Val Ala Val Ala Arg His Gly Ala Arg Leu Glu Leu Ser
 20 25 30
 Ala Ala Ala Trp Ala Arg Ile Asp Asn Ala Arg Ala Ile Val Cys Arg
 35 40 45
 Ile Val Ala Asn Gly Glu Arg Ala Tyr Gly Ile Ser Thr Gly Leu Gly
 50 55 60

0983745 071804

Ala 65	Leu	Cys	Asp	Val	Leu 70	Leu	Glu	Gly	Glu	Gln 75	Leu	Ala	Glu	Leu	Ser 80
Arg	Asn	Thr	Leu	Leu 85	Ser	His	Ala	Cys	Gly 90	Val	Gly	Glu	Pro	Leu 95	Arg
Asp	Glu	Gln	Thr 100	Arg	Ala	Ile	Ile	Cys 105	Ala	Ala	Val	Ala	Asn 110	Tyr	Ser
Gln	Gly	Lys 115	Ser	Gly	Leu	Asp	Arg 120	Ser	Leu	Val	Glu	Gly 125	Leu	Leu	Ala
Leu 130	Leu	Asn	His	Gly	Ile	Thr 135	Pro	Gln	Val	Pro	Ala 140	Gln	Gly	Ser	Val
Gly 145	Tyr	Ser	Gly	Asp	Leu 150	Thr	His	Met	Ala	His 155	Val	Gly	Ile	Ala	Leu 160
Leu	Gly	Ile	Gly	Glu 165	Val	Ser	Asp	Tyr	Arg 170	Gly	Ser	Val	Val	Pro 175	Ala
Ala	Ala	Ala	Leu 180	Ala	Ala	Glu	Gly	Leu 185	Ala	Thr	Val	Arg	Leu 190	Gly	Ala
Lys	Asp	Gly 195	Leu	Cys	Leu	Val	Asn 200	Gly	Thr	Pro	Cys 205	Met	Thr	Gly	Leu
Ala 210	Cys	Leu	Ala	Leu	Asp	Asp 215	Ala	Gln	Arg	Leu	Ala 220	Gln	Trp	Ala	Asp
Val 225	Ile	Gly	Ala	Met	Ser 230	Phe	Glu	Ala	Leu	Arg 235	Gly	Gln	Leu	Ala	Ala 240
Phe	Asp	Ala	Glu	Ile 245	His	Val	Ala	Leu	Lys 250	Pro	His	Pro	Gly	Met 255	Gln
Arg	Val	Ala	Ala 260	Asn	Leu	Arg	Ala	Leu 265	Leu	Ala	Gly	Ser	Gln 270	Val	Leu
Glu	Asn	Ala 275	Arg	Glu	Gly	Gly	Ile 280	Arg	Thr	Gln	Asp	Ala 285	Leu	Ser	Ile
Arg 290	Ser	Ile	Pro	Gln	Ile	His 295	Gly	Ala	Cys	Arg	Asp 300	Gln	Leu	Ala	His
Ala 305	Arg	Gln	Ile	Glu	Thr 310	Arg	Glu	Leu	Asn	Ser 315	Ala	Thr	Asp	Asn	Pro 320
Leu	Leu	Leu	Gly	Thr 325	Pro	Glu	Val	Val	Ser 330	Gln	Ala	Asn	Pro	His 335	Gly
Glu	Ser	Val	Ala 340	Met	Ala	Ala	Asp	Leu 345	Leu	Ala	Ile	Ala	Val 350	Ala	Glu
Leu	Gly	Gly 355	Val	Ala	Glu	Arg	Arg 360	Leu	Asp	Arg	Leu	Val 365	Asn	Pro	Leu

Val Ser Arg Gly Leu Pro Ala Phe Leu Val Gly Lys Pro Gly Val Asn
 370 375 380

Ser Gly Met Met Ile Thr Gln Tyr Val Ala Ala Ser Leu Ala Gly Glu
 385 390 395 400

Asn Arg Gln Leu Ala Gln Pro Ala Val Val Asp Asn Phe Val Thr Ser
 405 410 415

Ala Leu Gln Glu Asp His Leu Ser Leu Gly Thr Ser Ala Ala Leu Lys
 420 425 430

Leu Gly Arg Ala Leu Glu Asn Leu Arg Arg Ile Leu Ala Ile Glu Tyr
 435 440 445

Leu Leu Ala Ala Gln Ala Phe Glu Phe Leu Ala Pro Gln Arg Phe Gly
 450 455 460

Gln Gly Thr Ala Ala Ala Trp Gly Ile Leu Arg Glu Arg Val Pro Ala
 465 470 475 480

Tyr Asp Thr Asp Arg Trp Leu Ala Pro Asp Ile Ala Ser Ala Ala Ala
 485 490 495

Ile Leu Gly Glu Arg Lys Ser Leu Ala Arg Leu Ala Ala Ser Ile Gly
 500 505 510

Asp

<210> 56
 <211> 513
 <212> PRT
 <213> Homo sapiens

<400> 56

Lys Tyr Arg Glu Pro Glu Lys Tyr Ile Glu Leu Asp Gly Leu Thr Thr
 1 5 10 15

Glu Asp Leu Val Asn Leu Gly Lys Gly Arg Tyr Lys Ile Lys Leu Thr
 20 25 30

Pro Thr Ala Glu Lys Arg Val Gln Lys Ser Arg Glu Val Ile Asp Ser
 35 40 45

Ile Ile Lys Glu Lys Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly
 50 55 60

Lys Phe Ala Thr Arg Thr Val Ile Pro Ile Asn Lys Leu Gln Leu Gln
 65 70 75 80

Val Asn Leu Val Arg Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser
 85 90 95

Pro Glu Arg Cys Arg Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala
 100 105 110

033345-071301

Lys	Gly	Tyr	Ser	Gly	Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu
		115					120					125			
Met	Phe	Asn	Ala	Ser	Cys	Leu	Pro	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu
145					150					155					160
Val	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala
				165					170					175	
Lys	Tyr	Val	Leu	Glu	Ala	His	Gly	Leu	Lys	Pro	Val	Ile	Leu	Lys	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu
		195					200					205			
Gly	Cys	Glu	Ala	Val	Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp
	210					215					220				
Ile	Val	Ala	Ala	Leu	Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala
225					230					235					240
Phe	Asp	Thr	Asp	Ile	His	Ala	Pro	Leu	Arg	Pro	His	Arg	Gly	Gln	Ile
				245					250					255	
Glu	Val	Ala	Phe	Arg	Phe	Arg	Ser	Leu	Leu	Ser	Asp	Ser	Glu	Ile	Ala
			260					265					270		
Glu	Ser	His	Arg	Phe	Cys	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Thr	Leu
		275					280					285			
Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	Val	Asn	Asp	Thr	Ile	Ala	Phe
	290					295					300				
Val	Lys	Asn	Ile	Ile	Thr	Thr	Glu	Leu	Asn	Ser	Ala	Thr	Asp	Asn	Pro
305					310					315					320
Met	Val	Phe	Ala	Asn	Gly	Glu	Thr	Val	Ser	Gly	Gly	Asn	Phe	His	Gly
				325					330					335	
Glu	Tyr	Pro	Ala	Lys	Ala	Leu	Asp	Tyr	Leu	Ala	Ile	Gly	Ile	His	Glu
			340					345					350		
Leu	Ala	Ala	Ile	Ser	Glu	Arg	Arg	Ile	Glu	Arg	Leu	Cys	Asn	Pro	Ser
		355					360					365			
Leu	Ser	Arg	Glu	Leu	Pro	Ala	Phe	Leu	Val	Ala	Glu	Gly	Gly	Leu	Asn
	370					375					380				
Ser	Gly	Phe	Met	Ile	Ala	His	Cys	Thr	Ala	Ala	Ala	Leu	Val	Ser	Glu
385					390					395					400
Asn	Lys	Ala	Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Leu	Ser	Thr	Ser
				405					410					415	

093345-01601

Ala Ala Thr Glu Asp His Val Ser Met Gly Gly Trp Ala Ala Arg Lys
 420 425 430

Ala Leu Arg Val Ile Glu His Val Glu Gln Val Leu Ala Ile Glu Leu
 435 440 445

Leu Ala Ala Cys Gln Gly Ile Glu Phe Leu Arg Pro Leu Lys Thr Thr
 450 455 460

Thr Pro Leu Glu Lys Val Tyr Asp Leu Val Arg Ser Val Val Arg Pro
 465 470 475 480

Trp Ile Lys Asp Arg Phe Met Ala Pro Asp Ile Glu Ala Ala His Arg
 485 490 495

Leu Leu Leu Glu Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu
 500 505 510

Lys

<210> 57
 <211> 513
 <212> PRT
 <213> Caenorhabditis elegans

<400> 57
 Val Leu Ala Pro Pro Thr Lys Leu Leu Ile Leu Asp Gly Asn Ser Pro
 1 5 10 15

Glu Asp Leu Val Arg Cys Glu Lys Gly Glu Cys Ala Ile Gln Leu Ser
 20 25 30

Met Glu Ser Glu Asp Arg Ile Arg Lys Ala Arg Thr Phe Leu Glu Lys
 35 40 45

Ile Ala Ser Glu His Arg Ala Val Tyr Gly Val Thr Thr Gly Phe Gly
 50 55 60

Thr Phe Ser Asn Val Thr Ile Pro Pro Glu Lys Leu Lys Lys Leu Gln
 65 70 75 80

Leu Asn Leu Ile Arg Ser His Ala Thr Gly Tyr Gly Glu Pro Leu Ala
 85 90 95

Pro Asn Arg Ala Arg Met Leu Leu Ala Leu Arg Ile Asn Ile Leu Ala
 100 105 110

Lys Gly His Ser Gly Ile Ser Val Glu Asn Ile Lys Lys Met Ile Ala
 115 120 125

Ala Phe Asn Ala Phe Cys Val Ser Tyr Val Pro Gln Gln Gly Thr Val
 130 135 140

Gly Cys Ser Gly Asp Leu Cys Pro Leu Ala His Leu Ala Leu Gly Leu
 145 150 155 160

TOP20"SH2EE60

Leu	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Thr	Thr	Gly	Trp	Gln	Pro	Ala
				165					170					175	
Asp	Val	Val	Leu	Lys	Lys	Asn	Asn	Leu	Glu	Pro	Leu	Glu	Leu	Gly	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Val	Thr	Ala	Leu
		195					200					205			
Gly	Ala	Tyr	Thr	Leu	Glu	Arg	Ala	His	Asn	Ile	Ala	Arg	Gln	Ala	Asp
	210					215					220				
Val	Ile	Ala	Ala	Leu	Ser	Leu	Asp	Val	Leu	Lys	Gly	Thr	Thr	Arg	Ala
225					230					235					240
Tyr	Asp	Pro	Asp	Ile	His	Arg	Pro	Ile	Arg	Pro	His	Arg	Gly	Gln	Asn
				245					250					255	
Leu	Ser	Ala	Leu	Arg	Leu	Arg	Ala	Leu	Leu	Asn	Pro	Ser	Gln	Ile	Ala
			260					265					270		
Glu	Ser	His	Arg	Asn	Cys	Thr	Gly	Lys	Val	Gln	Asp	Ala	Tyr	Thr	Leu
		275					280					285			
Arg	Cys	Val	Pro	Gln	Val	His	Gly	Val	Val	His	Asp	Thr	Ile	Glu	Phe
	290					295					300				
Val	Arg	Glu	Ile	Ile	Thr	Thr	Glu	Met	Asn	Ser	Ala	Thr	Asp	Asn	Pro
305					310					315					320
Leu	Val	Phe	Ala	Asp	Arg	Glu	Ile	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly
				325					330					335	
Glu	Tyr	Pro	Ala	Lys	Ala	Leu	Asp	Phe	Leu	Ala	Ile	Ala	Val	Ala	Glu
			340					345					350		
Leu	Ala	Gln	Met	Ser	Glu	Arg	Arg	Leu	Glu	Arg	Leu	Val	Asn	Lys	Glu
		355					360					365			
Leu	Ser	Arg	Gly	Leu	Pro	Thr	Phe	Leu	Thr	Pro	Asp	Gly	Gly	Leu	Asn
	370					375					380				
Ser	Gly	Phe	Met	Thr	Val	Gln	Leu	Cys	Ala	Ala	Ser	Leu	Val	Ser	Glu
385					390					395					400
Asn	Lys	Val	Leu	Cys	His	Pro	Ser	Ser	Val	Asp	Ser	Ile	Pro	Thr	Ser
				405					410					415	
Cys	Asn	Gln	Glu	Asp	His	Val	Ser	Met	Gly	Gly	Phe	Ala	Ala	Arg	Lys
			420					425					430		
Ala	Leu	Thr	Val	Val	Glu	His	Val	Glu	Ala	Val	Leu	Ala	Met	Glu	Leu
		435					440					445			
Leu	Ala	Ala	Cys	Gln	Gly	Ile	Glu	Phe	Leu	Lys	Pro	Leu	Ile	Ser	Thr
	450					455					460				

098334E 071804
FOR 20 SEP 60

Thr

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<210> 58
<211> 513
<212> PRT
<213> Thermoplasma acidophilum
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<400> 58															
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Glu	Asp	Val	Tyr	Ala	Val	Ala	Val	Glu	Tyr	Asp	Arg	Val	Ser	Ile	Ser
			20					25					30		
Asp	Asp	Thr	Leu	Lys	Ala	Val	Glu	Glu	Lys	His	Glu	Ala	Phe	Leu	Lys
		35					40					45			
Leu	Ile	Asn	Ser	Gly	Lys	Thr	Val	Tyr	Gly	Val	Asn	Thr	Gly	Phe	Gly
	50					55					60				
Ser	Leu	Leu	Asn	Val	His	Ile	Glu	Arg	Asp	Gln	Glu	Ile	Glu	Leu	Gln
65					70					75					80
Lys	Asn	Leu	Ile	Arg	Ser	His	Ser	Ser	Gly	Val	Gly	Asp	Tyr	Leu	Glu
				85					90					95	
Asn	Arg	Tyr	Val	Arg	Ala	Ile	Met	Ala	Val	Arg	Leu	Asn	Ser	Leu	Ala
			100					105					110		
Ala	Gly	Tyr	Ser	Ala	Val	Ser	Ala	Asp	Leu	Leu	Asn	Met	Met	Val	Glu
		115					120					125			
Met	Leu	Asn	Arg	Asp	Val	Ile	Pro	Ala	Val	Pro	Lys	Tyr	Gly	Ser	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Ile	Gly	Leu	Ala	Met
145					150					155					160
Met	Gly	Glu	Gly	Lys	Ala	Phe	Asp	Phe	Glu	Gly	Arg	Leu	Met	Asp	Ser
				165					170					175	
Ala	Arg	Ala	Leu	Glu	Lys	Ala	Gly	Leu	Lys	Pro	Tyr	Gln	Phe	Lys	Glu
			180					185					190		
Lys	Glu	Gly	Val	Ala	Leu	Ile	Asn	Gly	Thr	Ser	Phe	Met	Ser	Gly	Ile
		195					200					205			

Leu Ser Ile Ala Val Met Asp Ala His Asp Ile Leu Glu Asn Ala Ile
 210 215 220
 Arg Ser Ala Leu Leu Ser Phe Glu Ala Leu Gly Gly Thr Ser Lys Ala
 225 230 235 240
 Phe Thr Pro Trp Ile Leu Gly Ala Leu Arg Pro His Leu Gly Gln Val
 245 250 255
 Ala Ile Gly Asn Arg Phe Arg Glu Tyr Leu Thr Gly Ser Asp Ile Val
 260 265 270
 Ala Ser Lys Arg Ala Asp Ser Val Lys Val Gln Asp Ala Tyr Thr Leu
 275 280 285
 Arg Cys Ile Pro Gln Val Tyr Gly Ser Val Ala Asp Val Ile Asp Tyr
 290 295 300
 Val Glu Asn Val Leu Ser Val Glu Ile Asn Ser Ala Thr Asp Asn Pro
 305 310 315 320
 Leu Val Phe Asn Gly Glu Glu Val Val Ser Gly Gly Asn Phe His Gly
 325 330 335
 Glu Pro Val Ala Leu Ala Ala Asp Phe Leu Ala Ile Ala Leu Thr Asp
 340 345 350
 Leu Gly Asn Met Val Glu Arg Arg Ile Ala Arg Leu Val Asp Thr Asn
 355 360 365
 Leu Ser Arg Gly Leu Pro Pro Phe Leu Thr Pro Asp Ser Gly Leu Asn
 370 375 380
 Ser Gly Tyr Met Ile Pro Gln Tyr Thr Ala Ala Ala Leu Cys Asn Arg
 385 390 395 400
 Asn Lys Val Leu Ala Tyr Pro Ser Ser Ala Asp Thr Ile Pro Thr Ser
 405 410 415
 Ala Asn Gln Glu Asp His Val Ser Met Gly Ala Thr Gly Ser Leu Lys
 420 425 430
 Leu Leu Glu Ile Ile Asp Asn Val Arg Tyr Ile Ile Ala Ile Glu Tyr
 435 440 445
 Leu Leu Gly Ser Gln Ala Leu Glu Phe Thr Asp Lys Leu Gly Met Ser
 450 455 460
 Pro Ser Thr Arg Lys Ile Tyr Glu Lys Ile Arg Glu Lys Val Glu Lys
 465 470 475 480
 Leu Asp His Asp Arg Pro Pro Ser Phe Asp Ile Glu Thr Ile Arg Lys
 485 490 495
 Met Met Asp Lys Lys Glu Phe Ile Ser Ala Leu Pro Ala His Leu Pro
 500 505 510

Ala

09334
 01301

<400> 59

Glu Asp Leu Val Asn Leu Gly Lys Gly Arg Tyr Lys Ile Lys Leu Thr
20 25 30

Ile Ile Lys Glu Arg Thr Val Val Tyr Gly Ile Thr Thr Gly Phe Gly
50 55 60

Val Asn Leu Val Arg Ser His Ser Ser Gly Val Gly Lys Pro Leu Ser
85 90 95

Pro Glu Arg Cys Arg Met Leu Leu Ala Leu Arg Ile Asn Val Leu Ala
100 105 110

Lys Gly Tyr Ser Gly Ile Ser Leu Glu Thr Leu Lys Gln Val Ile Glu
115 120 125

Ala Phe Asn Ala Ser Cys Leu Ser Tyr Val Pro Glu Lys Gly Thr Val
130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ser His Leu Ala Leu Gly Leu
145 150 155 160

Ile Gly Glu Gly Lys Met Trp Ser Pro Lys Ser Gly Trp Ala Asp Ala
165 170 175

Lys Tyr Val Leu Glu Ala His Gly Leu Lys Pro Ile Val Leu Lys Pro
180 185 190

Lys Glu Gly Leu Ala Leu Ile Asn Gly Thr Gln Met Ile Thr Ser Leu
195 200 205

Gly Cys Glu Ala Leu Glu Arg Ala Ser Ala Ile Ala Arg Gln Ala Asp
210 215 220

Ile Val Ala Ala Leu Thr Leu Glu Val Leu Lys Gly Thr Thr Lys Ala
225 230 235 240

Phe Asp Thr Asp Ile His Ala Pro Val Arg Pro His Arg Gly Gln Ile
245 250 255

Lys

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<210> 60
<211> 513
<212> PRT
<213> Mus musculus
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<400> 60

Lys	Tyr	Arg	Glu	Pro	Glu	Lys	Tyr	Ile	Ala	Leu	Asp	Gly	Asp	Ser	Thr
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Glu	Asp	Leu	Val	Asn	Leu	Gly	Lys	Gly	Arg	Tyr	Lys	Ile	Lys	Leu	Thr
			20					25					30		
Ser	Ile	Ala	Glu	Lys	Lys	Val	Gln	Gln	Ser	Arg	Glu	Val	Ile	Asp	Ser
		35					40					45			
Ile	Ile	Lys	Glu	Arg	Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly
	50					55					60				
Lys	Phe	Ala	Thr	Arg	Thr	Val	Ile	Pro	Ala	Asn	Lys	Leu	Gln	Leu	Gln
65					70					75					80
Val	Asn	Leu	Val	Arg	Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser
				85					90					95	
Pro	Glu	Arg	Cys	Arg	Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Val	Leu	Ala
			100					105					110		
Lys	Gly	Tyr	Ser	Gly	Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu
		115					120					125			
Ala	Phe	Asn	Ala	Ser	Cys	Leu	Ser	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu
145					150					155					160
Ile	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala
				165					170					175	
Lys	Tyr	Val	Leu	Glu	Ala	His	Gly	Leu	Lys	Pro	Ile	Val	Leu	Lys	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu
		195					200					205			
Gly	Cys	Glu	Ala	Leu	Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp
	210					215					220				
Ile	Val	Ala	Ala	Leu	Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala
225					230					235					240
Phe	Asp	Thr	Asp	Ile	His	Ala	Pro	Val	Arg	Pro	His	Arg	Gly	Gln	Ile
				245					250					255	
Glu	Val	Ala	Phe	Arg	Phe	Arg	Ser	Leu	Leu	Ser	Asp	Ser	Glu	Ile	Ala
			260					265					270		
Glu	Ser	His	Arg	Phe	Cys	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Thr	Leu
		275					280					285			
Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	Val	Asn	Asp	Thr	Ile	Ala	Phe
	290					295					300				

0503245-07104

Lys

<400> 61

Ser Ile Ala Glu Lys Lys Val Gln Gln Ser Arg Glu Val Ile Asp Ser
35 40 45

Ile	Ile	Lys	Glu	Arg	Thr	Val	Val	Tyr	Gly	Ile	Thr	Thr	Gly	Phe	Gly
	50					55					60				
Lys	Phe	Ala	Thr	Arg	Thr	Val	Ile	Pro	Ala	Asn	Lys	Leu	Gln	Leu	Gln
65					70					75					80
Val	Asn	Leu	Val	Arg	Ser	His	Ser	Ser	Gly	Val	Gly	Lys	Pro	Leu	Ser
				85					90					95	
Pro	Glu	Arg	Cys	Arg	Met	Leu	Leu	Ala	Leu	Arg	Ile	Asn	Val	Leu	Ala
			100					105					110		
Lys	Gly	Tyr	Ser	Gly	Ile	Ser	Leu	Glu	Thr	Leu	Lys	Gln	Val	Ile	Glu
		115					120					125			
Val	Phe	Asn	Ala	Ser	Cys	Leu	Ser	Tyr	Val	Pro	Glu	Lys	Gly	Thr	Val
	130					135					140				
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ser	His	Leu	Ala	Leu	Gly	Leu
145					150					155					160
Ile	Gly	Glu	Gly	Lys	Met	Trp	Ser	Pro	Lys	Ser	Gly	Trp	Ala	Asp	Ala
				165					170					175	
Lys	Tyr	Val	Leu	Glu	Ala	His	Gly	Leu	Lys	Pro	Ile	Val	Leu	Lys	Pro
			180					185					190		
Lys	Glu	Gly	Leu	Ala	Leu	Ile	Asn	Gly	Thr	Gln	Met	Ile	Thr	Ser	Leu
		195					200					205			
Gly	Cys	Glu	Ala	Val	Glu	Arg	Ala	Ser	Ala	Ile	Ala	Arg	Gln	Ala	Asp
	210					215					220				
Ile	Val	Ala	Ala	Leu	Thr	Leu	Glu	Val	Leu	Lys	Gly	Thr	Thr	Lys	Ala
225					230					235					240
Phe	Asp	Thr	Asp	Ile	His	Ala	Pro	Val	Arg	Pro	His	Arg	Gly	Gln	Ile
				245					250					255	
Glu	Val	Ala	Phe	Arg	Phe	Arg	Ser	Leu	Leu	Ser	Asp	Ser	Glu	Ile	Ala
			260					265					270		
Glu	Ser	His	Arg	Phe	Cys	Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Thr	Leu
		275					280					285			
Arg	Cys	Cys	Pro	Gln	Val	His	Gly	Val	Val	Asn	Asp	Thr	Ile	Ala	Phe
	290					295					300				
Val	Lys	Asp	Ile	Ile	Thr	Thr	Glu	Leu	Asn	Ser	Ala	Thr	Asp	Asn	Pro
305					310					315					320
Met	Val	Phe	Ala	Ser	Gly	Glu	Thr	Ile	Ser	Gly	Gly	Asn	Phe	His	Gly
				325					330					335	
Glu	Tyr	Pro	Ala	Lys	Ala	Leu	Asp	Tyr	Leu	Ala	Ile	Gly	Val	His	Glu
			340					345					350		

Leu Ala Ala Ile Ser Glu Arg Arg Ile Glu Arg Leu Cys Asn Pro Ser
 355 360 365
 Leu Ser Arg Glu Leu Pro Ala Phe Leu Val Ala Glu Gly Gly Leu Asn
 370 375 380
 Ser Gly Phe Met Ile Ala His Cys Thr Ala Ala Ala Leu Val Ser Glu
 385 390 395 400
 Ser Lys Ala Leu Cys His Pro Ser Ser Val Asp Ser Leu Ser Thr Ser
 405 410 415
 Ala Ala Thr Glu Asp His Val Ser Met Gly Gly Trp Ala Ala Arg Lys
 420 425 430
 Ala Leu Arg Val Ile Glu His Val Glu Gln Val Leu Ala Ile Glu Leu
 435 440 445
 Leu Ala Ala Cys Gln Gly Ile Glu Phe Leu Arg Pro Leu Lys Thr Thr
 450 455 460
 Thr Pro Leu Glu Lys Val Tyr Asp Leu Val Arg Ser Val Val Arg Pro
 465 470 475 480
 Trp Ile Lys Asp Arg Phe Met Ala Pro Asp Ile Glu Ala Ala His Arg
 485 490 495
 Leu Leu Leu Asp Gln Lys Val Trp Glu Val Ala Ala Pro Tyr Ile Glu
 500 505 510

Lys

<210> 62

<211> 513

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: Uncultured bacterium
pCosAS1

<400> 62

Met Ala Ser Met Asn Ala Leu Thr Leu Thr Pro Gly Thr Leu Thr Leu
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 Ala Gln Leu Arg Gln Val Trp Gln Gln Pro Leu Gln Leu Thr Leu Asp
 20 25 30
 Glu Ser Ala His Glu Ala Ile Asn Asp Ser Val Ala Cys Val Glu Ala
 35 40 45
 Ile Val Ala Glu Gly Arg Thr Ala Tyr Gly Ile Asn Thr Gly Phe Gly
 50 55 60
 Leu Leu Ala Gln Thr Arg Ile Ala Thr His Asp Leu Glu Asn Leu Gln
 65 70 75 80

09031201542E350

Arg	Ser	Leu	Val	Leu	Ser	His	Ala	Ala	Gly	Val	Gly	Glu	Pro	Leu	Asp	85	90	95
Asp	Asp	Ile	Val	Arg	Leu	Met	Met	Val	Leu	Lys	Ile	Asn	Ser	Leu	Ala	100	105	110
Arg	Gly	Phe	Ser	Gly	Ile	Arg	Leu	Ser	Val	Ile	Gln	Ala	Leu	Ile	Ala	115	120	125
Leu	Val	Asn	Ala	Gly	Val	Tyr	Ser	Val	Asp	Pro	Ala	Lys	Gly	Ser	Val	130	135	140
Gly	Ala	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Ala	His	Met	Ser	Leu	Thr	Leu	145	150	155
Leu	Gly	Glu	Gly	Lys	Ala	Arg	Asp	Tyr	Arg	Gly	Glu	Trp	Leu	Pro	Ala	165	170	175
Ala	Thr	Ala	Leu	Gln	Lys	Ala	Gly	Leu	Ala	Pro	Val	Thr	Leu	Ala	Ala	180	185	190
Lys	Glu	Gly	Leu	Ala	Leu	Leu	Asn	Gly	Thr	Gln	Ala	Ser	Thr	Ala	Phe	195	200	205
Ala	Leu	Arg	Gly	Leu	Phe	Glu	Ala	Glu	Asp	Leu	Phe	Ala	Ser	Ala	Val	210	215	220
Val	Cys	Gly	Ala	Leu	Thr	Thr	Glu	Ala	Val	Leu	Gly	Ser	Arg	Arg	Pro	225	230	235
Phe	Asp	Ala	Arg	Ile	His	Glu	Pro	Val	Arg	Gly	Gln	Arg	Gly	Gln	Ile	245	250	255
Asp	Ala	Ala	Ala	Leu	Phe	Arg	His	Val	Leu	Thr	Asp	Thr	Ser	Ala	Ile	260	265	270
Ala	Ser	His	His	Asn	Cys	Asp	Gly	Lys	Val	Gln	Asp	Pro	Tyr	Ser	Leu	275	280	285
Arg	Cys	Gln	Pro	Gln	Val	Met	Gly	Ala	Cys	Leu	Thr	Gln	Met	Arg	Gln	290	295	300
Val	Ala	Glu	Val	Leu	Leu	Val	Glu	Ser	Asn	Ala	Val	Ser	Asp	Asn	Pro	305	310	315
Leu	Val	Phe	Ala	Ala	Asn	Glu	Met	Val	Phe	Arg	Gly	Asn	Phe	His	Ala	325	330	335
Glu	Pro	Val	Ala	Met	Ala	Ala	Asp	Asn	Leu	Ala	Leu	Ala	Ile	Ala	Glu	340	345	350
Ile	Gly	Ala	Leu	Ser	Glu	Arg	Arg	Ile	Ala	Leu	Met	Met	Asp	Lys	His	355	360	365
Met	Ser	Gln	Asp	Leu	Pro	Pro	Phe	Leu	Val	Arg	Asn	Gly	Gly	Val	Asn	370	375	380

09833745-071901

Ala

<400> 63

Met 1	Ala	Ser	Ala	Met 5	Gly	Glu	Met	Ile	Ser 10	Leu	Asp	Gly	Pro	Leu 15	Thr
Trp	Arg	Glu	Ile 20	Ala	Ser	Ile	Ala	Glu 25	Gly	Ala	Ser	Leu	Asp 30	Leu	Ser
Gly	Pro	Ala 35	Arg	Leu	Arg	Ile	Ala 40	Gln	Ala	Arg	Arg	Ile 45	Val	Asp	Ala
Leu	Val 50	Glu	Arg	Gly	Ile	Arg 55	Gly	Tyr	Gly	Ile	Asn 60	Thr	Gly	Val	Gly
Ala 65	Leu	Cys	Asp	Val	Ile 70	Ile	Ser	Arg	Glu	Asn 75	Gln	Gln	Ala	Leu	Ser 80
Arg	Asn	Ile	Ile	Leu 85	Ser	His	Ala	Cys	Gly 90	Val	Gly	Asp	Pro	Leu 95	Gly
Arg	Val	Glu	Ala 100	Arg	Ala	Val	Met	Ala 105	Ala	Gln	Ile	Ala	Asn 110	Leu	Thr
His	Gly 115	Tyr	Ser	Gly	Val	Arg	Val 120	Glu	Thr	Ala	Glu	Met 125	Leu	Leu	Ala

Leu	Leu	Asn	Ala	Asp	Ile	Ile	Pro	Leu	Ile	Pro	Ser	Arg	Gly	Ser	Val
130						135					140				
Gly	Tyr	Ser	Gly	Asp	Leu	Ala	Pro	Leu	Thr	His	Ala	Ala	Leu	Val	Leu
145					150					155					160
Ile	Gly	His	Gly	Ser	Ala	Met	Gln	Gly	Thr	Glu	Arg	Leu	Ser	Gly	Ala
				165					170					175	
Asp	Ala	Leu	Phe	Ala	Arg	Leu	Gly	Leu	Ala	Pro	Leu	Arg	Leu	Glu	Ala
			180					185					190		
Lys	Glu	Gly	Leu	Ser	Leu	Val	Asn	Gly	Thr	Pro	Cys	Ala	Thr	Gly	Leu
		195					200					205			
Ala	Ala	Leu	Ala	Leu	Ala	Arg	Thr	Glu	Arg	Leu	Phe	Ala	Trp	Ala	Asp
		210				215					220				
Ala	Ala	Ala	Ala	Met	Thr	Tyr	Glu	Ala	Asn	Leu	Gly	Ser	Gln	Ala	Asn
225					230					235					240
Ala	Phe	Ala	Glu	Leu	Pro	Leu	Ala	Leu	Arg	Gln	Ser	Pro	Gly	Leu	Ser
				245					250					255	
Ala	Val	Gly	Glu	Gly	Leu	Arg	Asp	Trp	Leu	Ala	Asp	Ser	Pro	Met	Leu
			260					265					270		
Ala	Gly	His	Arg	Thr	Ala	Gly	Thr	Arg	Thr	Gln	Asp	Pro	Leu	Ser	Leu
		275					280					285			
Arg	Ala	Val	Pro	Gln	Val	His	Gly	Ala	Ala	Arg	Asp	Ala	Phe	Gly	Gln
		290				295					300				
Val	Ala	Glu	Ile	Val	Asp	Arg	Glu	Leu	Ala	Ser	Val	Thr	Asp	Asn	Pro
305					310					315					320
Ala	Val	Ala	Gly	Ser	Pro	Glu	Val	His	Ser	Gln	Ala	His	Ala	Val	Gly
				325					330					335	
Ala	Ala	Leu	Gly	Leu	Ala	Met	Asp	Ser	Leu	Ala	Val	Ala	Val	Ala	Glu
			340					345					350		
Val	Ala	Ala	Ile	Ser	Glu	Arg	Arg	Ile	Asp	Arg	Leu	Val	Asn	Pro	Leu
		355					360					365			
Val	Ser	Arg	Gly	Leu	Pro	Ala	Phe	Leu	Ala	Gly	Asp	Ser	Gly	Val	Ser
		370				375					380				
Ser	Gly	Phe	Met	Ile	Ala	Gln	Tyr	Thr	Ala	Ala	Ala	Leu	Val	Ala	Glu
385					390					395					400
Asn	Arg	Arg	Leu	Ala	Ala	Pro	Ala	Ser	Leu	Asp	Gly	Gly	Ile	Thr	Ser
				405					410					415	
Ala	Leu	Gln	Glu	Asp	Met	Leu	Thr	His	Ala	Thr	Pro	Ala	Ala	Trp	Lys
			420					425					430		

09833745 071801

Ala Leu Ser Ile Val Asp Asn Leu Glu Arg Ile Leu Ala Ile Glu Leu
435 440 445

Leu Ala Ala His Arg Pro Met Ser Cys Ser Arg Lys Arg Arg Ala Arg
450 455 460

Arg Asn Ala Pro Leu Pro Phe Thr Gly Thr Tyr Ala Arg Arg Ser Pro
465 470 475 480

Pro Ile Ala Thr Ile Val Arg Ser Ala Glu Leu Glu Ala Ala Tyr Asp
485 490 495

Leu Leu Ala Asn Gly Ser Val His Lys Ala Leu Glu Ala His Leu Pro
500 505 510

Ala

<210> 64

<211> 513

<212> PRT

<213> Halobacterium sp.

<400> 64

Met Ala Ser Ala Pro Gln Ile Thr Leu Gly Leu Ser Gly Ala Thr Ala
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Asp Asp Val Ile Ala Val Ala Arg His Glu Ala Arg Ile Ser Ile Ser
20 25 30

Pro Gln Val Leu Glu Glu Leu Ala Ser Val Arg Ala His Ile Asp Ala
35 40 45

Leu Ala Ser Ala Asp Thr Pro Val Tyr Gly Ile Ser Thr Gly Phe Gly
50 55 60

Ala Met Ser Asp Thr Arg Ile Asp Ala Ala Asp Arg Glu Ala Leu Gln
65 70 75 80

Ala Asn Leu Val Arg Ser His Ala Ala Gly Ala Gly Ser Glu Leu Asp
85 90 95

Thr Ala Ala Val Arg Ala Leu Leu Val Thr Arg Leu Asn Ala Leu Ala
100 105 110

Lys Gly Tyr Ser Gly Ile Arg Glu Arg Val Leu Asp Val Leu Val Gly
115 120 125

Leu Leu Asn Glu Gly Val His Pro Val Val Pro Ser Arg Gly Ser Leu
130 135 140

Gly Ala Ser Gly Asp Leu Ala Pro Leu Ala His Met Ser Arg Val Leu
145 150 155 160

Ile Gly Glu Gly Gln Ala Thr Asp Val Ala Gly Glu Arg Met Pro Ala
165 170 175

090315 071304

Ala	Glu	Ala	Leu 180	Ala	Ala	Ala	Asp	Leu 185	Glu	Pro	Val	Thr	Leu 190	Gln	Ala
Lys	Glu	Gly 195	Leu	Ala	Leu	Ile	Asn 200	Gly	Thr	Gln	Leu	Thr 205	Thr	Gly	Val
Ala	Ala 210	Leu	Ala	Leu	Val	Asp 215	Ala	Glu	Arg	Val	Leu 220	Arg	Ser	Ala	Asp
Thr 225	Ala	Gly	Ala	Leu	Thr 230	Thr	Glu	Val	Thr	Met 235	Ser	Thr	Thr	Ala	Ser 240
Cys	Ala	Pro	Ala	Ile 245	His	Glu	Pro	Val	Arg 250	Pro	His	Asp	Gly	Gln 255	Ala
Val	Ser	Ala	Arg 260	His	Ile	Arg	Asn	Leu 265	Thr	Ala	Gly	Ser	Glu 270	Val	Leu
Asp	His	His 275	Arg	Asp	Cys	Asp	Gly 280	Arg	Val	Gln	Asp	Ala 285	Tyr	Ser	Ile
Arg	Cys 290	Leu	Pro	Gln	Val	His 295	Gly	Ala	Val	Arg	Asp 300	Ala	Leu	Asp	His
Leu 305	Arg	Ala	Ala	Val	Ala 310	Thr	Glu	Leu	Asn	Ser 315	Ala	Thr	Asp	Asn	Pro 320
Leu	Val	Phe	Pro	Ser 325	Gly	Thr	Val	Val	Ser 330	Gly	Gly	Asn	Phe	His 335	Gly
Glu	Val	Leu	Ala 340	Leu	Arg	Leu	Gly 345	Tyr	Ala	Ala	Ser	Ala	Leu 350	Ala	Glu
Leu	Ala	Ala 355	Ile	Ser	Glu	Arg	Arg 360	Thr	Asp	Arg	Leu	Leu 365	Asn	Pro	Glu
Thr	Gln 370	Glu	Pro	Leu	Glu	Pro 375	Phe	Leu	Ala	Pro	Asp 380	Ser	Gly	Leu	His
Ser 385	Gly	Leu	Met	Ile	Pro 390	Gln	Tyr	Thr	Ala	Ala 395	Ser	Leu	Val	Asn	Asp 400
Leu	Arg	Ser	Leu	Gly 405	Gln	Pro	Ala	Thr	Leu 410	Asp	Asn	Ala	Ser	Val 415	Ser
Gly	Ala	Gln	Glu 420	Asp	His	Val	Ser 425	Met	Ser	Ala	Gly	Ala	Ala 430	Tyr	Asn
Phe	Arg	Glu 435	Ala	Val	Glu	Lys	Ala 440	Ala	Thr	Val	Val	Gly 445	Val	Glu	Leu
Leu	Cys 450	Gly	Ala	Gln	Gly	Arg 455	Glu	Phe	Leu	Asp	Pro 460	Leu	Ala	Leu	Gly
Ala 465	Gly	Thr	Ala	Ala	Ala 470	Tyr	Asp	Leu	Val	Arg 475	Ser	Glu	Val	Ser	Glu 480

Pro Ala Gly Asp Arg Ala Leu Ala Asp Asp Met Ala Ala Val Gly Asp
485 490 495

Leu Val Arg Ala Gly Leu Val Glu Asp Ala Val Ala Arg Ala Leu Asp
500 505 510

Ala

<210> 65

<211> 504

<212> PRT

<213> Streptomyces griseus

<400> 65

Val Val Val Gly Thr Ser Gly Thr Thr Ala Glu Asp Val Val Ala Val
1 5 10 15

Ala Arg His Gly Ala Arg Val Glu Leu Ser Ala Ala Ala Val Glu Ala
20 25 30

Leu Ala Ala Ala Arg Leu Ile Val Asp Ala Leu Ala Ala Lys Pro Glu
35 40 45

Pro Val Tyr Gly Val Ser Thr Gly Phe Gly Ala Leu Ala Ser Arg His
50 55 60

Ile Gly Thr Glu Leu Arg Ala Gln Leu Gln Arg Asn Ile Val Arg Ser
65 70 75 80

His Ala Ala Gly Met Gly Pro Arg Val Glu Arg Glu Val Val Arg Ala
85 90 95

Leu Met Phe Leu Arg Leu Lys Thr Val Ala Ser Gly His Thr Gly Val
100 105 110

Arg Pro Glu Val Ala Gln Thr Met Ala Asp Val Leu Asn Ala Gly Ile
115 120 125

Thr Pro Val Val His Glu Tyr Gly Ser Leu Gly Cys Ser Gly Asp Leu
130 135 140

Ala Pro Leu Ser His Cys Ala Leu Thr Leu Met Gly Glu Gly Glu Ala
145 150 155 160

Glu Gly Pro Asp Gly Thr Val Arg Pro Ala Gly Glu Leu Leu Ala Ala
165 170 175

His Gly Ile Ala Pro Val Glu Leu Arg Glu Lys Glu Gly Leu Ala Leu
180 185 190

Leu Asn Gly Thr Asp Gly Met Leu Gly Met Leu Val Met Ala Leu Ala
195 200 205

Asp Leu Arg Asn Leu Tyr Thr Ser Ala Asp Ile Thr Ala Ala Leu Ser
210 215 220

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<210>	66
<211>	502
<212>	PRT

<213> Corynebacteriaceae sp.

<400> 66

Ile	Thr	Leu	Gly	Leu	Ser	Gly	Ala	Thr	Ala	Asp	Asp	Val	Ile	Ala	Val	1	5	10	15
Ala	Arg	His	Glu	Ala	Arg	Ile	Ser	Ile	Ser	Pro	Gln	Val	Leu	Glu	Glu	20	25	30	
Leu	Ala	Ser	Val	Arg	Ala	His	Ile	Asp	Ala	Leu	Ala	Ser	Ala	Asp	Thr	35	40	45	
Pro	Val	Tyr	Gly	Ile	Ser	Thr	Gly	Phe	Gly	Ala	Leu	Ala	Thr	Arg	His	50	55	60	
Ile	Ala	Pro	Glu	Asp	Arg	Ala	Lys	Leu	Gln	Arg	Ser	Leu	Ile	Arg	Ser	65	70	75	80
His	Ala	Ala	Gly	Met	Gly	Glu	Pro	Val	Glu	Arg	Glu	Val	Val	Arg	Ala	85	90	95	
Leu	Met	Phe	Leu	Arg	Ala	Lys	Thr	Leu	Ala	Ser	Gly	Arg	Thr	Gly	Val	100	105	110	
Arg	Pro	Val	Val	Leu	Glu	Thr	Met	Val	Gly	Met	Leu	Asn	Ala	Gly	Ile	115	120	125	
Thr	Pro	Val	Val	Arg	Glu	Tyr	Gly	Ser	Leu	Gly	Cys	Ser	Gly	Asp	Leu	130	135	140	
Ala	Pro	Leu	Ser	His	Cys	Ala	Leu	Val	Leu	Met	Gly	Glu	Gly	Glu	Ala	145	150	155	160
Thr	Asp	Ala	His	Gly	Asp	Ile	Arg	Pro	Val	Pro	Glu	Leu	Phe	Ala	Glu	165	170	175	
Ala	Gly	Leu	Thr	Pro	Val	Glu	Leu	Ala	Glu	Lys	Glu	Gly	Leu	Ala	Leu	180	185	190	
Val	Asn	Gly	Thr	Asp	Gly	Met	Leu	Gly	Gln	Leu	Ile	Met	Ala	Leu	Ala	195	200	205	
Asp	Leu	Asp	Glu	Leu	Leu	Asp	Ile	Ala	Asp	Ala	Thr	Ala	Ala	Met	Ser	210	215	220	
Val	Glu	Ala	Gln	Leu	Gly	Thr	Asp	Gln	Val	Phe	Arg	Ala	Glu	Leu	His	225	230	235	240
Glu	Pro	Leu	Arg	Pro	His	Pro	Gly	Gln	Gly	Arg	Ser	Ala	Gln	Asn	Met	245	250	255	
Phe	Ala	Phe	Leu	Ala	Asp	Ser	Pro	Ile	Val	Ala	Ser	His	Arg	Glu	Gly	260	265	270	
Asp	Gly	Arg	Val	Gln	Asp	Ala	Tyr	Ser	Leu	Arg	Cys	Ser	Pro	Gln	Val	275	280	285	

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[illegible]